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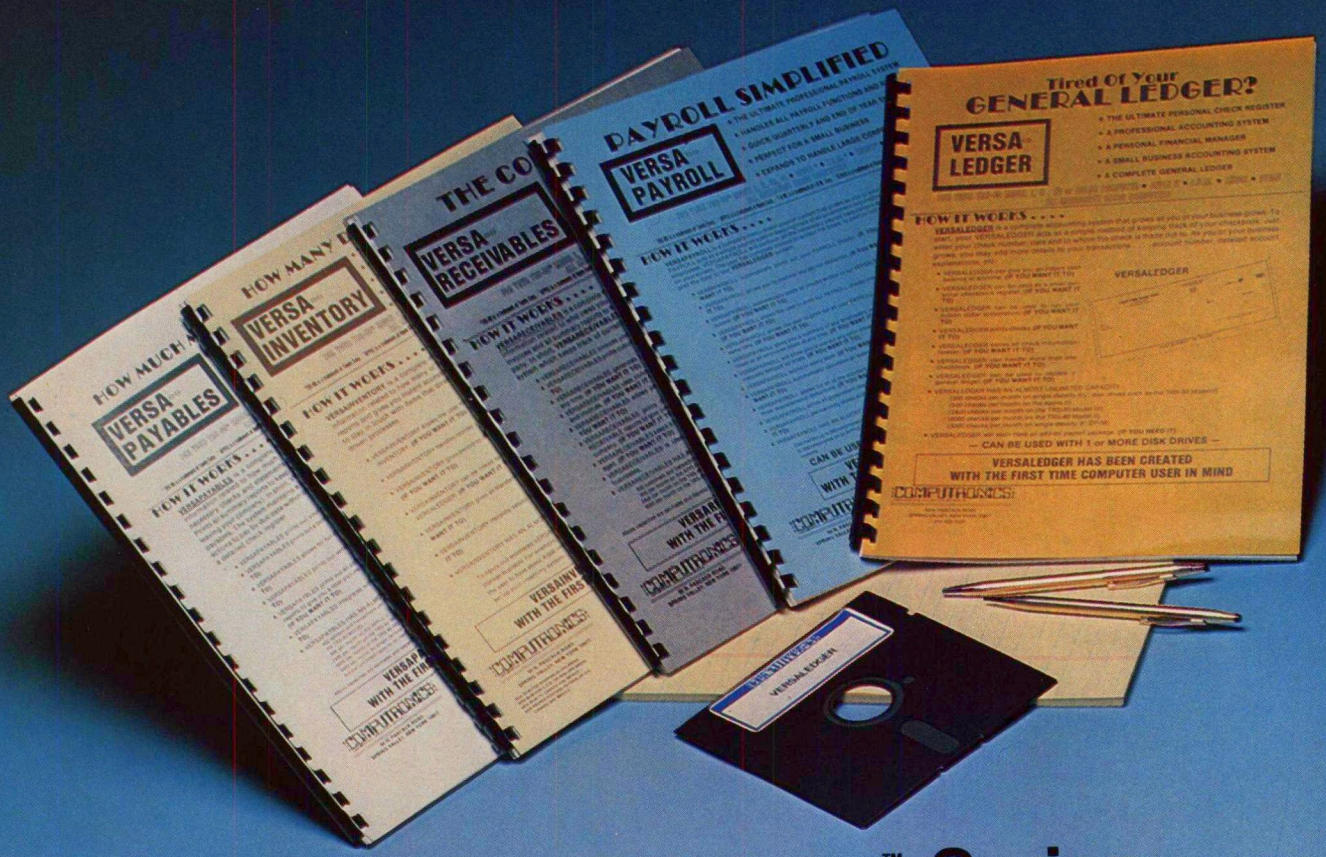

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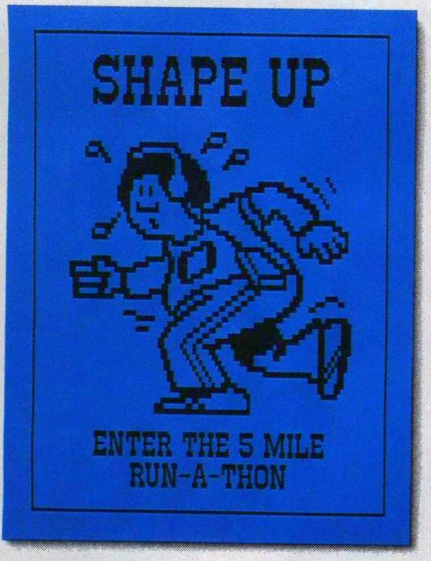

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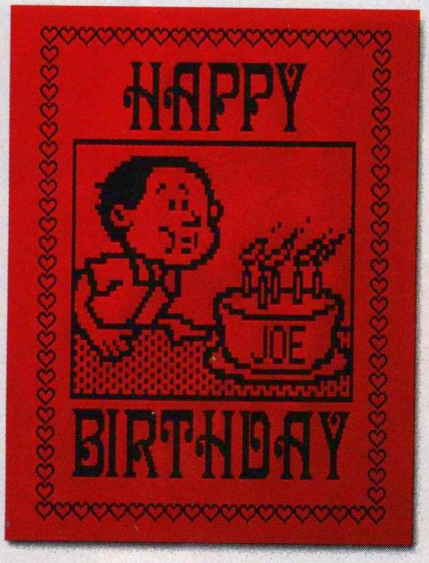

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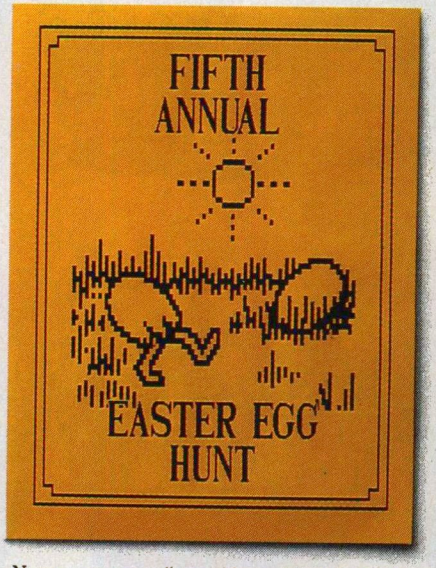

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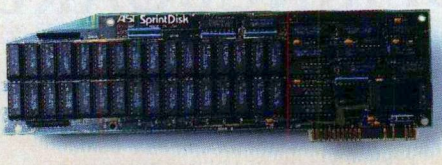

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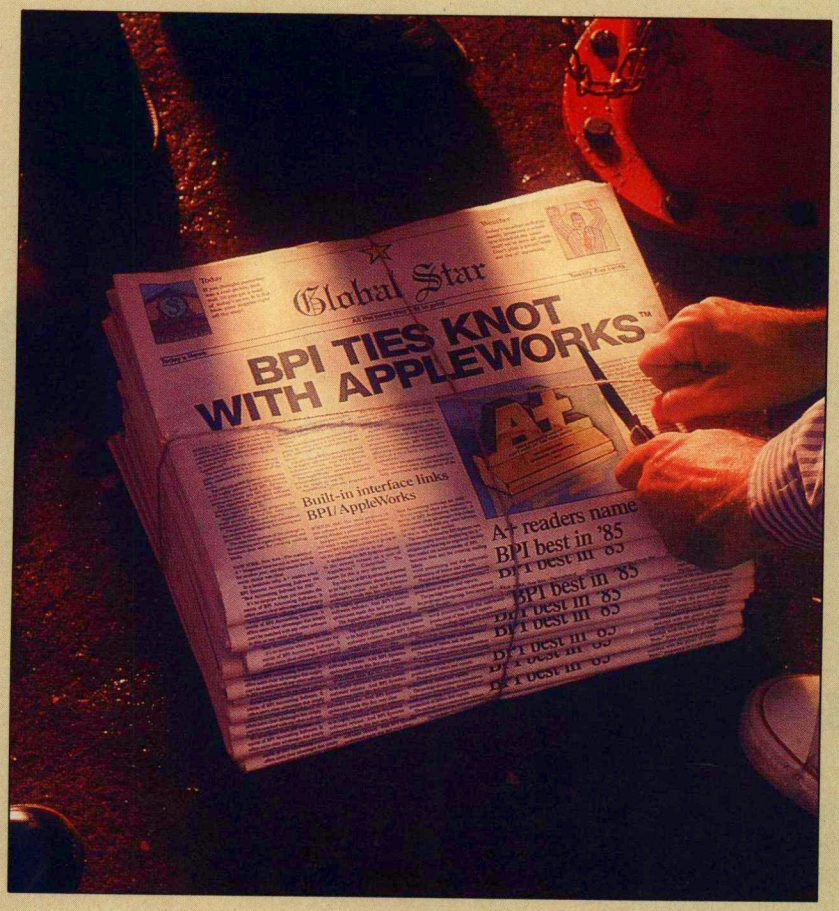

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Contents

APRIL 1986/VOLUME 4/ISSUE 4

A+

THE INDEPENDENT GUIDE TO APPLE COMPUTING

COVER STORIES

24 TELECOMMUNICATIONS SOFTWARE

BY RUSS LOCKWOOD

Bringing telecommunications to your desktop requires more than just a modem and a couple of cables. If you want to log onto a service automatically, send and receive files, and perform any one of many other productive functions, you need one of these telecommunications programs to operate your modem.

46 TELECOMMUNICATIONS HARDWARE

BY RUSS LOCKWOOD

The key to unlocking telecommunications' long-distance power is a modem, a device that allows your Apple computer to communicate with another computer over common telephone lines. Modems come in all sizes and shapes, so if you're in the market for one or just want a refresher course, be sure to read this article.

56 TELECOMMUNICATIONS OUTLOOK

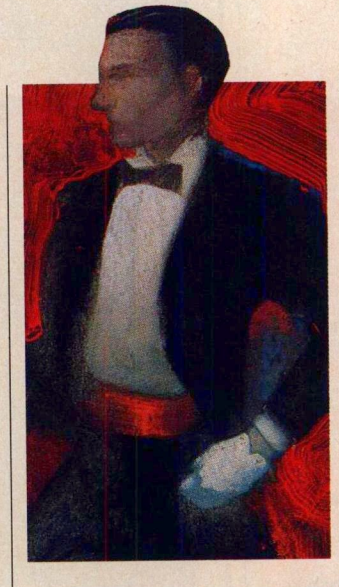
BY RUSS LOCKWOOD

An on-line crystal ball: Russ Lockwood looks into the future of telecommunications.

61 APPLELINK

BY SUE CRISSMAN

Ever had a problem with your Apple? What can you do when you can't figure something out and none of your friends know either? Now Apple dealers will be better able to deal with cutomers' difficulties if they are using AppleLink. This article provides details of the new troubleshooting service.



SOFTWARE

70 PINPOINT VS. JEEVES

BY KEN LANDIS

A new generation of software, desktop-accessory programs, has arisen. These programs are a combination of appointment book, alarm clock, conscience, and secretary. In this article, Ken Landis reviews two of the most popular desktop-accessory programs, Pinpoint and Jeeves.

HARDWARE

78 OPTICAL DATA STORAGE

BY JEFF HECHT

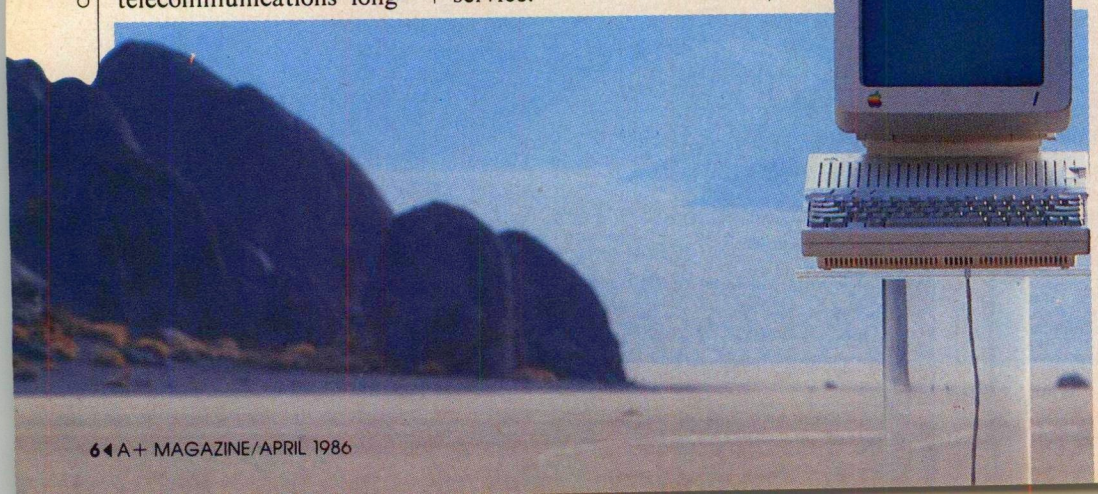
The latest innovation in data storage is a home-entertainment spin-off that brings new technology and new capabilities to your Apple. It's the CD-ROM, or Compact Disc Read Only Memory. It is the hottest item around, so if you want to know more, be sure to look at this article.

PROGRAMMING

86 INSTANT PASCAL

BY DAVID D. THORNBURG

If you are tired of the limitations of traditional Pascal or have been postponing learning the language at all, you should consider looking at this new program, created by Think Technologies and marketed by Apple. This remarkable new product so resembles Macintosh Pascal from Think Technologies that programs created on one machine can work on the other.



COVER PHOTO: CARTER DOW PHOTOGRAPHY

DEPARTMENTS

9 EDITORIAL

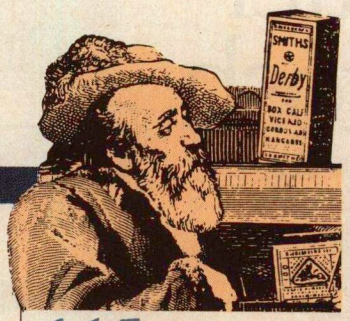
11 LETTERS

15 NEWSPLUS
BY FREDERIC E. DAVIS
News and views of the personal-computer industry

63 APPLEWORDS
BY STEVE ROSENTHAL
A short glossary of new acronyms

97 THE LEARNING CURVE
BY DAVID D. THORNBURG
The pros and cons of simulation programs in education, with a special look at Science Toolkit and its use with Logo

103 THAT'S ENTERTAINMENT
Ultima IV by Origin Systems, Inc.; Earthly Delights by Dan'l Leviton Company; Master of the Lamps by Activision; Millionaire by Blue Chip Software; and Karate Champ by Data East USA, Inc.



115 COMPUTER CALISTHENICS
BY MICHAEL WIESENBERG
A twist on last month's puzzle

144 PIPELINE
BY CAROL PERSON AND RHODA SIMMONS
Products you want to know about—for the entire Apple-computer line

154 THOUGHTWARE
BY STEVE ROSENTHAL
What does Instant Pascal portend?

157 RESCUE SQUAD
BY GREG MAINIS
Database/spreadsheet transfer with DIF files and AppleWorks queries

158 MACINTOSH DIRECTORY

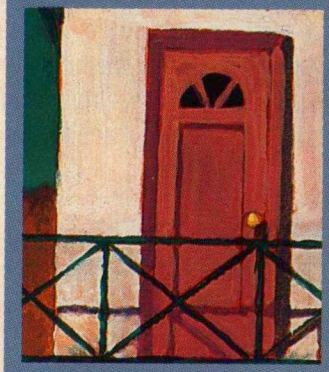
159 A+ DIRECTORY

162 A+ MART

164 INDEX TO ADVERTISERS

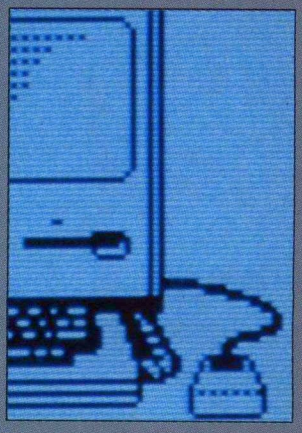
166 COMING SOON

MONTHLY MACINTOSH COVERAGE



120 DECISIONS, DECISIONS
BY SHARON ZARDETTO AKER
We're all presented with a myriad of decisions every day, both personal and professional. Now you can use your Macintosh to help you make decisions with decision-support software. In this article, Sharon Aker reviews MindSight, Decision Map, and Consultant.

130 EXPANDING THE APPLE MENU
BY SHARON ZARDETTO AKER
The days when Apple's standard desk accessories were the only ones available on the apple menu are long gone. Now that you can choose from hundreds of accessories, it's time to give some special recognition to some of the best in the field, including Art Grabber, ClickArt Effects, ClickOn Worksheet, SideKick, and BatteryPak.



137 PICTUREAIDE
BY MARK C. SUMNER
If you've ever wished you could put graphics into your BASIC programs, read this tutorial on how to do just that; it includes a program listing.

142 MACTIPS
Suggestions from our readers on shortcuts, a warning message, removing labels, and hidden powers of Font/DA Mover

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Michael Fischer, Columnist, Bay Area Computer Currents.
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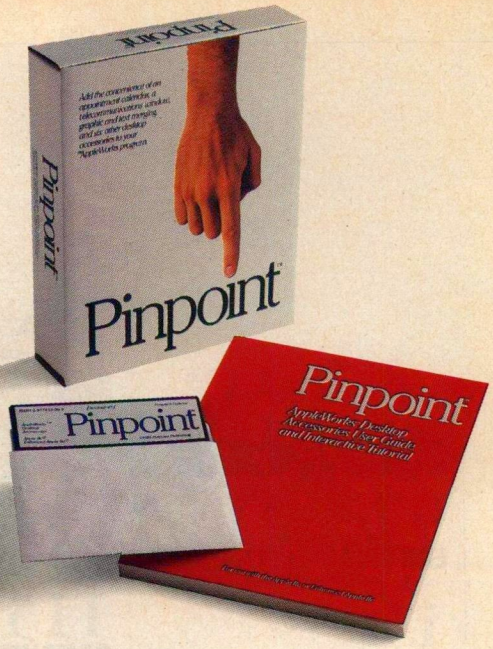

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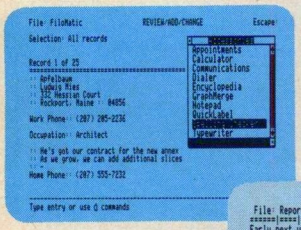

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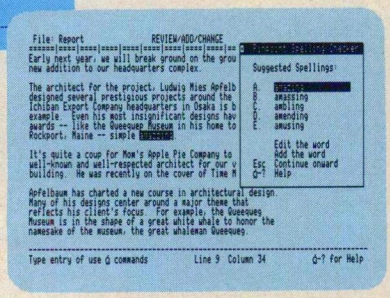

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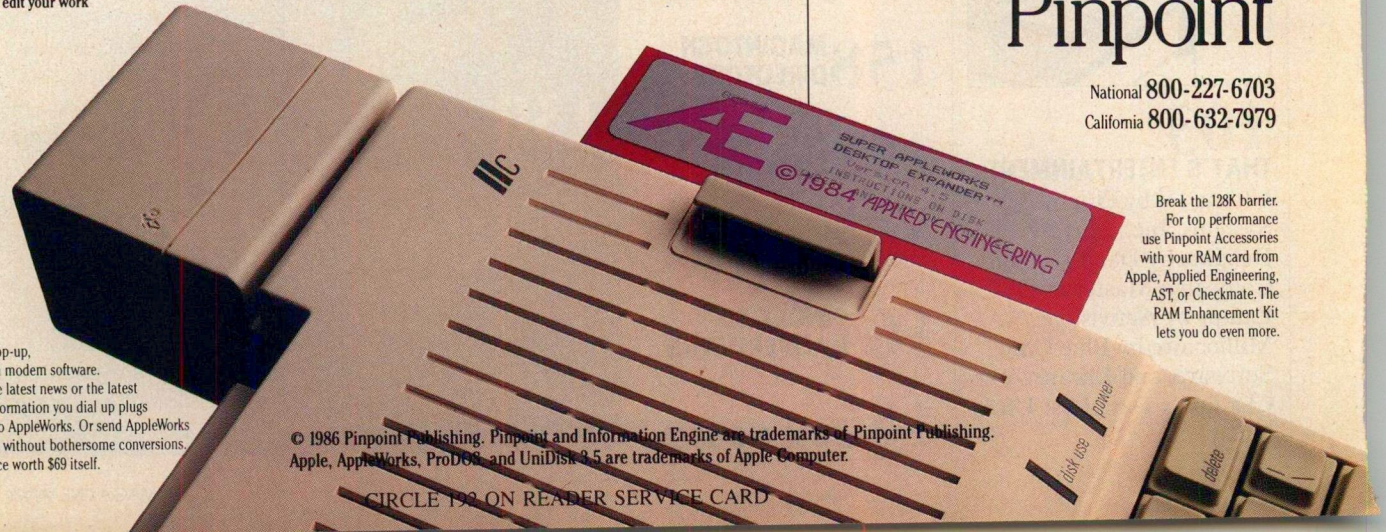

Break the 128K barrier. For top performance use Pinpoint Accessories with your RAM card from Apple, Applied Engineering, AST, or Checkmate. The RAM Enhancement Kit lets you do even more.

Includes pop-up, auto log-on modem software. Capture the latest news or the latest recipes; information you dial up plugs directly into AppleWorks. Or send AppleWorks documents without bothersome conversions. Convenience worth $69 itself.

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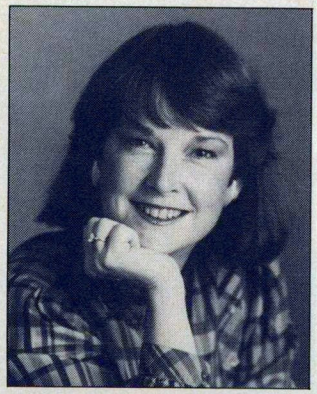
CIRCLE 193 ON READER SERVICE CARD



Message from Maggie

Because of streamlined operation and effective cost cutting, the fourth quarter of 1985 was Apple's most profitable ever.

THINGS ARE LOOKING UP AT APPLE

I made a wager in a recent editorial that Steve Jobs would return to assume a useful role at Apple Computer. That was just before Jobs' final bitter break when he stormed out with five employees and Apple promptly filed a lawsuit to protect technology developed at Apple. Well, I lost my bet, but that is the danger of wagering. Things have quieted down in the meantime, and it seems we've seen the last of the public rift between the company and its youngest founder, now that the litigation is resolved.

Deciding who owns what technology is an extremely difficult issue, which was the crux of the problem between Apple and Jobs.

Most companies, including Apple, are hard at work creating products that involve many new technologies, and companies often develop similar technologies simultaneously. The issue for Apple and Jobs came down to which of the new technologies was proprietary to Apple. This issue was a particularly sensitive one for Apple, since one of the people who left to join Jobs at his new company, Next, Inc., was Rich Page, who was purportedly working on an advanced workstation that ran the UNIX operating system. According to trade papers, Jobs wants to market high-level workstations for the university market that, he claims, will not be competitive with Apple's products. Apparently Jobs was able to persuade Apple that this assertion was true.

All this controversy has left Apple surprisingly unscathed. The stock has bounced back from the low it hit after the company's reorganization. Because of streamlined operation and effective cost cutting, the fourth quarter of 1985 was Apple's most profitable ever, and reports on sales during the critical fall selling season put Apple on a par with IBM in retail unit sales.

This year promises to be a banner year for Apple in several areas, including new CPUs and software. We just reported about one of the new hardware developments, the Mac Plus. As the Mac Plus indicates, much of what Apple does in the hardware arena will be in response to market needs, because it answers many critics' complaints about the original model.

Apple is also in the software spotlight, with an 11% market share, second only to Lotus and 7% more than IBM. Apple is said to be eyeing the software market with increased interest, which has third-party developers concerned. As of this writing, however, Apple is expected to announce the establishment of a $25 million venture-capital fund to help software developers produce products for its computers. If Apple makes a major push to develop more software, I hope it concentrates on developing software such as operating systems and utilities that either can't or won't be developed by outside vendors.

Since I'm bringing you up to date on what's happening at Apple, I thought you would also like to know what the other Steve, the Woz, is up to these days. He resigned from Apple last summer because he did not like the direction the new product development was taking, with its concentration on the Macintosh. Now he is working on a remote-control gadget for home-electronics lovers. Meanwhile, Woz seems to have patched up some of his differences with Apple, because he recently reinvested in Apple, reportedly to the tune of $5 million. You couldn't ask for a better statement of confidence! +

Maggie Canon

MAGGIE CANON/**EDITOR IN CHIEF**

RamWorks II™

Up to 5,000,000 bytes to feed the biggest appetites.

Now expand your Apple IIe to an incredible 5 megabytes of usable RAM!

First came RamWorks. The IIe expansion card that became the unquestioned industry standard. Now Applied Engineering has done it one better ... with RamWorks II — a card so advanced, so powerful, we challenge you to find *anything* it doesn't offer.

RamWorks II makes a single Apple go a miraculously long way. With all the additional memory you'll need to feed even the hungriest of programs. And with the included RamDrive™ software, even older programs can use RamWorks II memory.

"I wanted a memory card for my Apple that was fast, easy to use, and very compatible; so I bought RamWorks."

Steve Wozniak
Inventor of Apple Computer

Now AppleWorks works even better.

You can choose versions of RamWorks II ranging in power from 64K all the way up to a whopping 5 megabytes. Even a 256K RamWorks II gives you over 200K of additional usable AppleWorks desktop.

With a 256K or larger card, AppleWorks will automatically load itself into RamWorks II, dramatically increasing AppleWorks' speed and power by eliminating the time required to access disk drive 1. So you can switch from word processing to spreadsheet to database management at the speed of light.

Only RamWorks II eliminates AppleWorks' internal memory limits, increasing the maximum number of records available from 1,350 to over 15,000. *Only* RamWorks II increases the number of lines permitted in the word processing mode. And *only* RamWorks II (256K or larger) offers a built-in printer buffer, so you won't have to wait for your printer to stop before returning to AppleWorks. RamWorks II even expands the clipboard. And auto segments large files so they can be saved on two or more disks.

The most compatible, most expandable card available.

RamWorks II is compatible with more off-the-shelf software than any other RAM card, as well as *all* software written for Apple cards, and software written for most other RAM cards too! It's also compatible with all hardware add-ons like Profile and Sider hard disks.

As your needs grow, so does RamWorks II. It's designed to accommodate future advances in 16 and 32 bit microprocessors. A connector allows coprocessor cards to access up to 5 MEG of memory. RamWorks II is expandable to 1 MEG on the main card (more than most will ever need) ... but if you do ever need more, a low-profile (no slot 1 interference) memory expansion connector allows you to add 512K, 2 MEG or 4 MEG of extra memory without wasting another slot.

And now, in living color ...

For only $129, you can add RGB color for unsurpassed, super high-resolution color graphics and sharp 80 column text. *Without* wasting another slot — because our RGB option plugs right into RamWorks II (or original RamWorks) without slot 1 interference, and attaches to any Apple compatible RGB monitor (RGB option not necessary with a composite monitor). Order it now — or add it later.

Even corrects mistakes.

If you bought some other RAM card that's not being recognized by your programs, and you want RamWorks II, you're in for a nice surprise. Because all you have to do is plug the memory chips on your current card into the expansion sockets on RamWorks II to recapture most of your investment!

RamWorks II Prices:

with 64K ($179), with 256K ($219), with 512K ($269), with 1 MEG ($369), with 1.5 MEG ($539), with 3 MEG (CALL), with 5 MEG (CALL), RGB option ($129) (can be added later), 16 bit option ($89) (can be added later).

It's time you let *your* Apple handle a lot of big appetites. Order RamWorks II today ... with 15-day money back guarantee *and* our "no hassle" five-year warranty. Call 9 a.m. to 11 p.m. 7 days, or send check or money order to Applied Engineering.

MasterCard, VISA and C.O.D. welcome. Texas residents add 5⅛% sales tax. Add $10.00 outside U.S.A.

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Letters

We invite your comments.

SWYFTCARD RECOMMENDATIONS

Dear A+: To start with the usual disclaimer: I have never written to a magazine letter section before, etc. etc., but as a new computer user, I feel compelled to respond to Ken Kashmarek about his SwyftCard comments (February 1986, pages 14 and 15). That's right. I've been at this for only about a year now. I inherited an Apple IIe from my kids when they left for the service. I had to find the manuals to turn it on. I thought Mr. Raskin's reply about Ken's gigabyte setup was a little polite, and since I'm not in the computer business, I thought I'd add my two cents.

I ordered a SwyftCard about three months ago and have used it now for two months. It is, without a doubt, everything they say and then some. I made the point earlier about how new I am at this, and even at that I was using the card within an hour of receiving it. The SwyftCard manual, unlike others I've received, is very well written. The commands are easy, and even an idiot like me can paste the key labels on and follow them the first time out.

Another point for nonprofessional users like myself: I had a problem with interfacing the Okimate 20. A Mr. Paul Baker, a SwyftCard engineer, not only returned my first two calls promptly, but also called me twice to follow up on my problem. I've had other problems, being as new as I am, and feel lucky to even reach a knowledgeable person with some of these companies, and there he was calling me with suggestions and follow-up information. I've never seen that kind of support from (best left unnamed).

A point I need to make is that I own and use AppleWorks—another fine program—but I can type and print out a list or note to myself before AppleWorks has booted to my card. I don't need or want to watch 42 functions load. If I'm going to write a position report or something comparable, I'll use AppleWorks in a minute, but for a super fast little word processer that is almost ridiculously easy to learn and use, I would not hesitate to recommend the SwyftCard.

R.A. Wagner
El Paso, TX

PROGRAMMERS' THINKING PROCESSES ARE BASIC

Dear A+: David Thornburg's latest "Learning Curve" column (February 1986) is a disservice to A+ readers, including students. He overlooks the main ingredient of good programming: the programmer's thinking processes. Your columnist also neglects to mention the extra expense for another language. Using Turbo Pascal on an Apple requires a CP/M card (at least $250 for a good one). Would a school system junk the old 80-column cards replaced by new cards with Z80 coprocessors?

"We don't believe that a language should *dictate* how a person should write a program. This inhibits creativity and may even paint programmers into corners they do not wish to be in" (Dave Overton and Scott Terry, ZBASIC version 3.0 manual).

The genesis of *any* computer program is inside a human skull. BASIC is no more fallible than English; both languages exist in the real world, and they are imperfect. If our teachers can accept the challenge of teaching English, then BASIC, free and usable like English, can be a viable teaching medium.

There are so many good BASIC programs available. Tim Hartnell *(Giant Book of Computer Games)* has written several beautifully structured BASIC programs that run smoothly and quickly on all popular micros.

Allan Porter
Apple Certified Developer
New Braunfels, TX

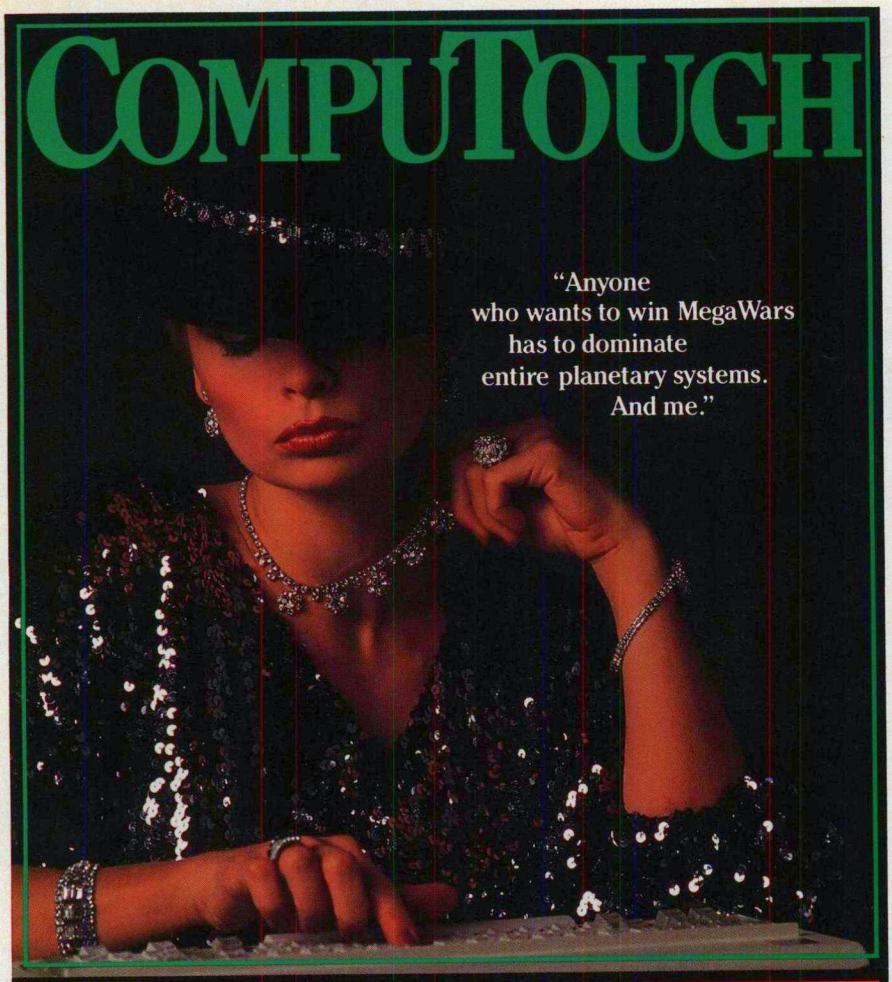
BASIC PROS AND CONS

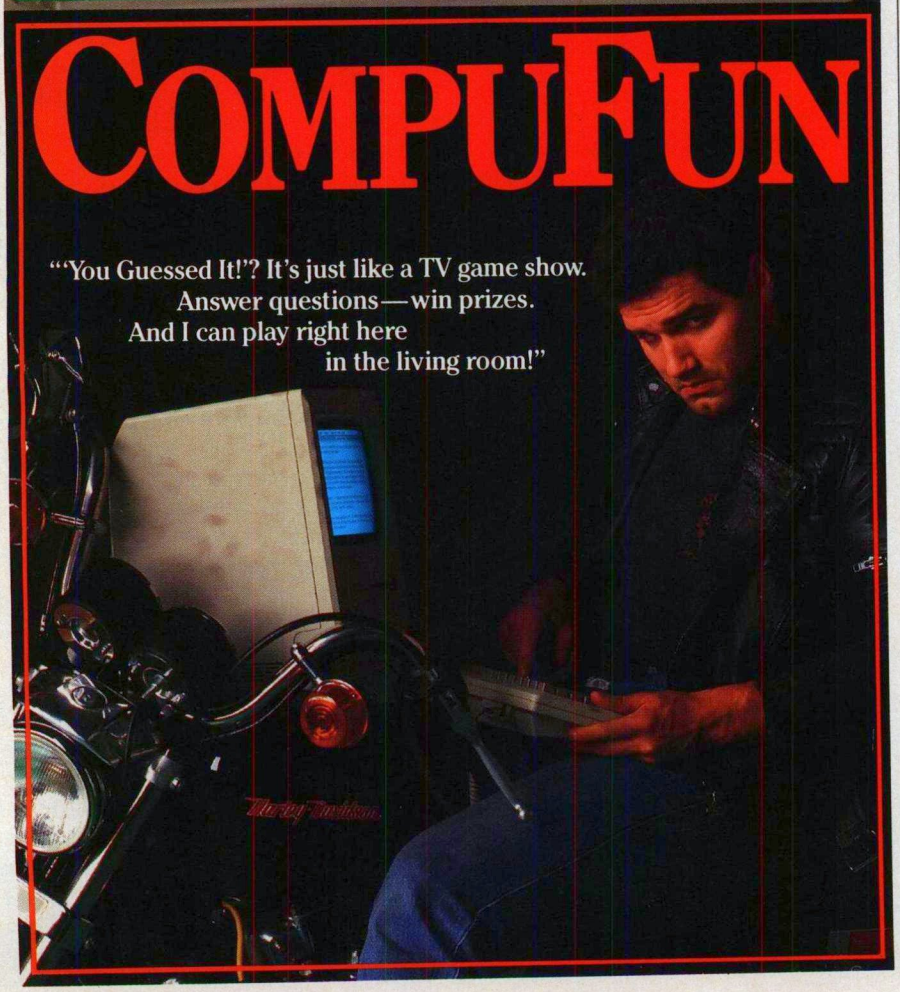
Dear A+: Don't take it personally, Guru Thornburg; you're not the only soul who's busy leading the world to a "better" programming language (see "The Learning Curve," A+, February 1986, pages 79 and 80).

I can see why you've tempered your belief in freedom of choice. Choosing, as BASIC permits, to omit the LET in the command LET A = A + 1 certainly helps your argument for equal signs having confusing meanings in BASIC. Let's look a little farther into this type of confusion.

LET A = A + 1 as well as IF A = B THEN . . . are both commands; they should be interpreted (at least by humans) as units. Trying to assign meaning to a single character within a command is as useless as trying to assign meaning to a single character within an English word. I suppose you prefer Pascal's solution, which takes *two* keystrokes (:=) to make an assignment symbol. Well, if you've got the time to type a few hundred extra keystrokes per program and the money for the RAM to hold them, go ahead. Just don't tell me that it's better than looking at a whole command to see what it means!

There are good points and bad points to everything mankind has done. English isn't perfect; with over half a million words (including technical terms) it is ridiculous to have confusion between *lead* and *lead* (*to entice from the front of the pack* and *a heavy metal*). Yet, English is a very popular second language, especially





in technically advanced countries, because it gets the job done effectively.

Learning Pascal might help one think with more structure; I gave up on it when I couldn't get it to print on the printer while running the program. Debugging is a pain when one has to wait for the whole run before seeing output! I'm quite happy to have fought with it for a few months; I'm also quite happy to let the theory boys have it. When I get rich (hah!), I'll buy a compiler and a text editor for Applesoft. When I have the time, I'll structure my BASIC programs myself.

BASIC, especially Microsoft's earliest popular version (Applesoft), has some programming problems. Yes, some of them are serious:

- The useful length of variable names, as you showed
- The inability to represent IF 12 > A > 100 THEN . . .—IF (12 > A) AND (A > 100) THEN . . . is too much typing for such a common mathematical expression
- Having only global variables, as you also pointed out. The ELSE that's not available with IF . . . THEN . . .
- Allowing one to wipe out a line one cannot see by a typographical error is just plain cruel!

BASIC does, however, have some very good points:

- It doesn't require years of study to learn to use it.
- It doesn't require a lot of special keys (hardware $$).
- It doesn't require lots of RAM or ROM.
- It doesn't require. . . ,therefore it allows the choice!
- It can be interpreted, compiled, or both!
- You can use it somewhat infrequently, yet successfully.
- You can quickly find line 20000 via LIST 20000, whereas finding a named PROCEDURE can take some searching.
- You can start using a variable at any time, without getting permission from the machine!

Any general-purpose computer language that requires non-ASCII characters is a ploy by the hardware builders to drive up the cost of the system with special keys! I'm painfully aware of ASCII's lack of a summation sign, a pi symbol, and many other mathematical symbols; but there are always those two-character variable names and multiple-line equations!

Remember, *BASIC* is not a word! It is a string of abbreviations, the first of which is for *beginner's*! It shouldn't be expected to handle the most esoteric of concepts in an eloquent manner. It shouldn't be expected to reign in the world of computerists. It *can* be expected to do what most nonprofessional programmers need done, in a way they can understand!

It is not surprising that Thornburg was able to find "experts" who would (quite truthfully) state their dislike for BASIC. If John Kemeny really liked to use BASIC, he would be a computer nobody (like me) instead of a world leader in computer languages.

Allan K. Mahler
Terre Haute, IN

AUTOMAC PRICE CORRECTION

Dear *A+*: We appreciate your coverage of our AutoMac macro program in your January issue (page 164), but the price you listed is incorrect. We are quite proud of our actual price of $19.95, which we have kept constant since September. We feel that this is an unusual price for *any* Macintosh program (lower even than that of most games) and that our program represents a genuine value to consumers. Incidentally, AutoMac has recently been updated to version 1.5 and works on both the 128K and 512K Macintosh.

H.C. William Anderson
Genesis Micro Software
Bellevue, WA

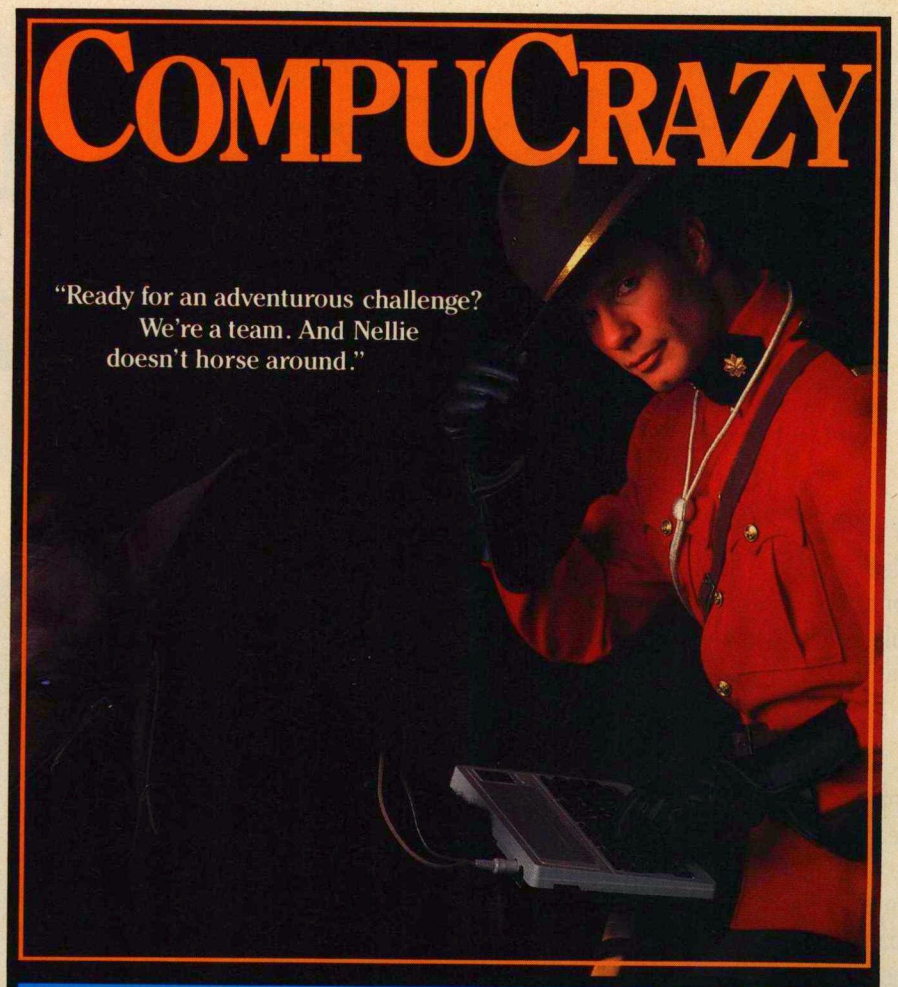
FANTAVISION FLAW

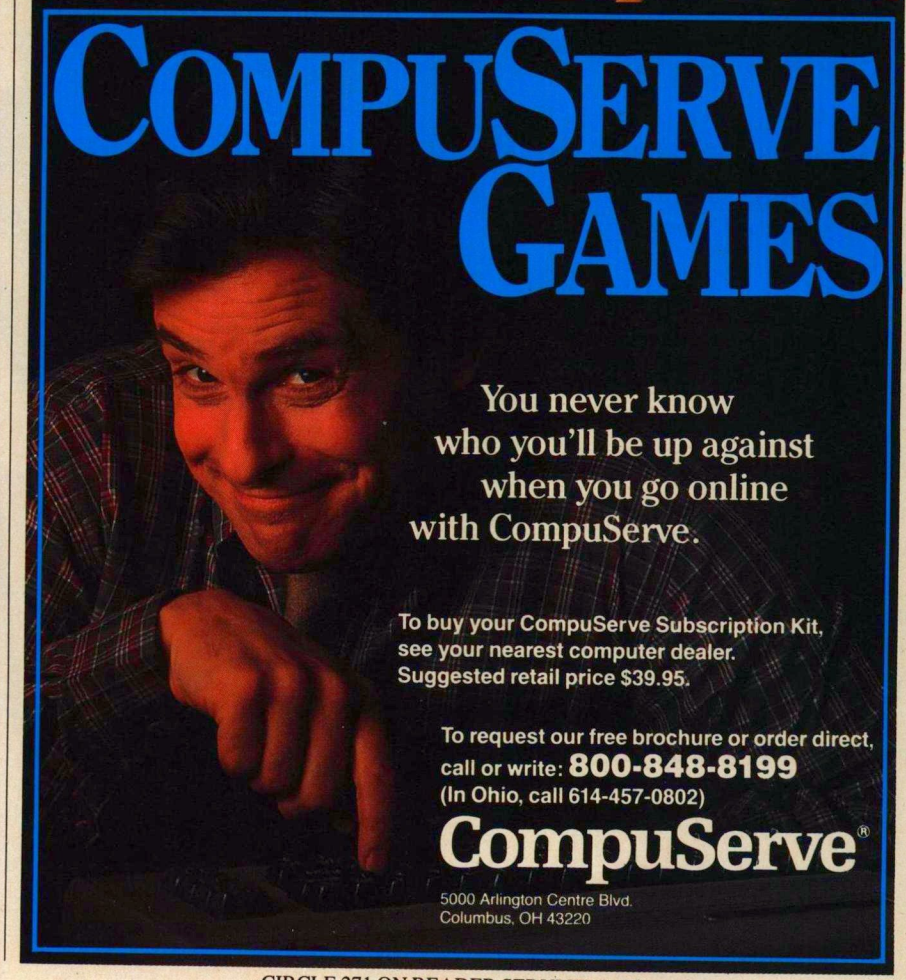
Dear *A+*: I was excited to see a software review on Fantavision (*A+*, February 1986, page 73) after Brøderbund demonstrated the program at our local Apple Computer club.

The article fails to discuss how Fantavision saves its shows on disk. The program initializes its own data disks but adds its own DOS. When you boot the data disk, it allows you to play the shows, but that is it. You cannot add a show onto the beginning of a piece of software or a game you have developed. The booted data disk allows you only to run the animations.

I find this a serious shortcoming for this program. The program should allow the animation to be added before any program and in DOS or ProDOS.

Zev Kahn
Castro Valley, CA





CIRCLE 271 ON READER SERVICE CARD

What the Experts are Saying About RamWorks II!®

"In an informal competition called '640K vs. 640K' AppleWorks running on a RamWorks equipped Apple IIe outperformed Symphony running on an IBM PC."
—InfoWorld

"AppleWorks wiped out Symphony... The competition was set up partly to show off another of Wozniak's favorite things, the RamWorks II memory expansion board from Applied Engineering . . ."
—San Jose Business Journal

"There are huge differences among the AppleWorks modifying programs sold with the cards. Without doubt, RamWorks II is the most powerful."
—inCider

"Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks. . . I like the product so much that I am buying one for my own system."
—A+ Magazine

"RamWorks II is the most powerful auxiliary slot memory card available for your IIe, and I rate it four stars... For my money, Applied Engineering's RamWorks II is king of the hill."
—inCider

As you can see, it's easy to tell who sets the pace in Apple memory expansion. In fact, if you read the competition's ads, you'll notice that many even claim to be as good as RamWorks. Some say they're "RamWorks compatible". At least they agree on one thing. RamWorks is the one they have to measure up to. But the truth is there aren't any substitutes for RamWorks.

Because RamWorks and Z-RAM have a mesmerizing list of characteristics that, as you use them, will change your perceptions of an Apple computer forever. Achieving a level of speed and performance most critics claim is the best they've ever seen. But we want to do more than impress the experts, we want to impress you!

Applied Engineering stands ready to solve your expansion needs today and tomorrow with the largest and best supported product line in the industry.

Call Applied Engineering at 214-241-6060, 9 am to 11 pm. To get the very best.

RamWorks II®

The recognized industry standard for memory expansion in the Apple IIe.

AE™

214-241-6060

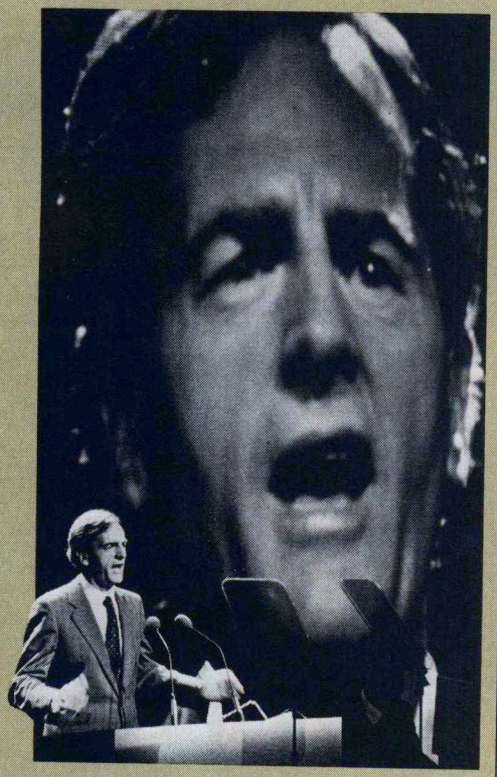
BY FREDERIC E. DAVIS

NewsPlus

'I view this conference as the most important event in my career at Apple.'

1986 APPLEWORLD CONFERENCE

The 1986 AppleWorld Conference was held in January in San Francisco. Apple used the event to formally introduce the Macintosh Plus computer and LaserWriter Plus printer. An Apple developers' conference and a large computer show featuring both the Macintosh and Apple II lines were held in conjunction with the event.



ABOVE: JOHN SCULLEY ADDRESSES THOUSANDS DURING A LIVE MULTI-MEDIA TELECAST TO MORE THAN 20 CITIES (AP PHOTO)

The conference's keynote address was given by Apple president John Sculley to thousands of dealers, developers, educators, analysts, business leaders, members of the press, representatives from Apple users' groups, and viewers in more than 20 cities who watched a live telecast of the speech. The multimedia presentation demonstrated Apple's traditional panache and started with a pop song that had special lyrics written to commemorate the event. The tone of the event quickly turned more serious, however, and was dominated by Sculley's superbly delivered speech.

"I view this conference as the most important event in my career at Apple," began Sculley. "It signals the beginning of a new era. An era of cooperation and responsiveness—and a beginning of a dialogue with you that will continue throughout the decade.

"Apple's products continue to grow in popularity and customer loyalty, despite new competitive entries. In fact, two of the three most popular families of personal computers in the world are Apples.

"In short, we are—organizationally, financially, and technologically—in the best position ever to remain the leader in the education and high-end consumer markets and compete for an increased share of the business market."

Sculley continued by outlining strategies that Apple will use for approaching the three markets—education, high-end consumer, and business—that Apple has targeted for development. He promised that Apple would continue to lead in educational computing by developing new products such as networks that link students to teachers and teachers to administrators and the rest of the academic community. These networks might include computers manufactured by IBM and DEC in place at many universities. Sculley also promised to work with educators at all levels to advance the use of computers as lifelong tools and for curriculum-based software.

Sculley said that Apple would put resources into developing consumer products in both the Apple II and Macintosh families for applications such as home banking, compact-disc databases, and the integration of computers and video equipment.

The business market has been tough for Apple ever since IBM introduced Charlie Chaplin to small-business people around

NewsPlus

All owners of Apple computers will be offered upgrade paths.

the country and Apple lost the dominance in the small-business market that the Apple II family once held.

Sculley pinned Apple's hopes in business on the Macintosh as a tool for business productivity, communications, and creation of documents and publications. Sculley referred to these three areas as desktop productivity, desktop communications, and desktop publishing.

Although Sculley said that Apple was continuing development on Apple II systems for education, consumer, and small-business use, he did not provide any specific details, other than promising some sort of network capabilities for schools. Many Apple II enthusiasts were hoping to hear more news about the Apple II series, because there has been considerable speculation that Apple is readying several new Apple II products, including a low-cost Apple II system for schools, an advanced version of the Apple II that uses the 16-bit 65816 chip, a more powerful version of the Apple IIc, AppleTalk for the Apple II series, and a CD-ROM disk drive.

After Sculley alluded to new Apple II products, he wrapped up his speech by saying, "There is so much for Apple—and you—to look forward to. We are not at the end of an incredible adventure—in fact, we have just barely begun.

"The glamour of the garage metaphor may be behind us, but the halcyon days are still ahead.

"The choices that Apple has made with its commitment to aggressively pursue 'the alternative technology' may seem courageous today but will be obvious tomorrow.

"Nineteen eighty-six will be a very hard year of work for all of us, but it will be a year where we will be working hard toward something—for something—that will carry us all into the Information Age."

APPLE LETS SCHOOLS TRADE IN OLD COMPUTERS

Schools can now trade in many of their old computers, including the Apple II; Apple II Plus; Apple III; IBM PCjr; Radio Shack Tandy II, III, and IV; some Commodore systems; other computers; and even IBM typewriters to get credit toward the purchase of new Apple equipment. The amount they get depends on the system, but a couple hundred dollars per system will probably be about average. Schools that are interested in this trade-in program should contact Apple and inquire about the Education Purchase Program.

TRADE-IN OFFER FOR LISA OWNERS

Apple will offer owners of Lisa and Macintosh XL computers the opportunity to trade their systems in for a Macintosh Plus and Hard Disk 20 (retail value $4290) for a fee of $1500. This price is equivalent to the price of the Hard Disk 20 alone, so the deal boils down to this: Pay for the Hard Disk 20 and get the Macintosh Plus as a trade for your Lisa. For more information, contact your local Apple dealer.

Some Lisa/Mac XL owners feel satisfied with their current system and do not plan to take advantage of the trade-in offer. The NetWorkers, publishers of *LisaTalk Report*, are conducting a survey of Lisa and Mac XL owners to find out if they plan to upgrade. Owners of these computers who are interested in participating in the survey or who want to receive *LisaTalk Report* can contact the NetWorkers at 21 Canyon Road, San Anselmo, CA 94960; (415) 258-9152.

APPLE COMMITTED TO UPGRADES

Apple president John Sculley declared at the AppleWorld Conference that all owners of Apple computers would be offered upgrade paths that would allow them to trade in older Apple models for current computers. Sculley pointed to the upgrade paths for the Macintoshes and Lisa to the Macintosh Plus and also cited Apple's trade-in offer to schools as an example of Apple's new policy of helping protect Apple owners from technology changes. When questioned about upgrade paths for owners of the Apple II and Apple II Plus, Sculley promised that Apple would eventually announce a plan for Apple II owners that would allow them to upgrade to current (or future) Apple II models.

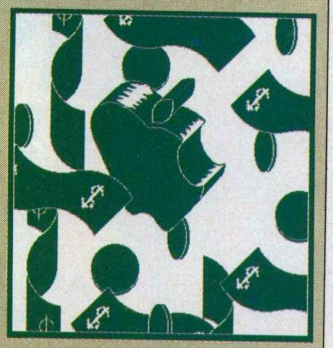
APPLE DOUBLES R&D SPENDING

Apple Computer is preparing to make major investments in new technology to ensure that it remains the premier technological innovator in the field of personal computing. In order to achieve this goal, Apple is doubling its research-and-development budget, is hiring many new engineers, and is planning to purchase a top-of-the-line Cray supercomputer. The Cray that Apple is planning to purchase is the Cray X-MP/48, which costs $15 million and is the most powerful computer in the world, with only ten units in existence. Apple plans to use the Cray to develop advanced software for the next generation of high-powered personal computers.

RECORD APPLE PROFITS

Many computer companies, including industry giant Commodore, are on shaky financial ground these days. Apple, however, is continuing to strengthen its financial position to ensure its long-term survival and allow the company to make major investments in research and development without having to get into debt.

Apple announced record profitability for the first quarter of fiscal 1986; although sales were down slightly from the same period last year, the streamlined organization managed to increase profits this quarter to $56.9



million (or $0.91 per share), compared with $46.1 million ($0.75 per share) last year. The company has no long-term debt and has record cash reserves of $441.5 million, which should help stave off any hardship such as an attack by IBM. In addition, *Fortune* magazine recently hailed Apple as the second-most-profitable publicly held company in the U.S.

"We are extremely pleased with the company's performance," says John Sculley, who successfully fought Apple founder Steve Jobs for control of the company last year. According to Sculley, "We accomplished our agenda for 1985. The reorganization is behind us; now it is back to the future."

Your Apple IIc deserves the time of day.

Our IIc System Clock offers automatic time and date stamping, puts time, year, month, date and day of week right on your screen!

Applied Engineering's revolutionary IIc System Clock plugs into either your modem or printer serial port ... and displays the time and date right on the AppleWorks screen. The time feature includes hours, minutes and seconds, and the date includes year, month, date and day of week.

All your work is *automatically* time and date stamped to give you a complete record of your work history. And since it's from Applied Engineering, you'll get our famous no-hassle five year warranty and a price that will persuade you.

FOR JUST $79, you can give your IIc the time of day, plus much more.

- Fully PRO-DOS compatible
- Automatic time and date stamping
- Easy to use from BASIC
- Date includes year, month, date and day of week
- Time includes hours, minutes, seconds
- Time and date stamps AppleWorks files
- Auto-access from AppleWorks database
- No-hassle five year warranty

Call 214-241-6060 TO ORDER TODAY 9 a.m. to 11 p.m. seven days, or send check or money order to Applied Engineering. MasterCard, Visa and C.O.D. welcome. Texas residents add 5⅛% sales tax. Add $10.00 outside U.S.A.

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MegaWorks with AppleWorks. MegaWorks is the Mail Merge and Spelling correction program designed exclusively for AppleWorks. MegaWorks' mail merge lets you combine information from AppleWorks database files with word processing documents to print personalized form letters. MegaWorks' spelling checker corrects misspelled words in documents and allows you to customize its 40,000-word dictionary with 10,000 more words of your own. Both mail merge and spelling correction maintain word wrapping and pagination of documents.

ReportWorks with AppleWorks. ReportWorks is the powerful report generator that uses your AppleWorks files to print lists, fill out forms, and analyze your data. In fact, ReportWorks allows you to produce just about any kind of report in any kind of format. And ReportWorks can add tax, look up prices, calculate discounts, enter client information automatically, and much, much more. Now, with AppleWorks and ReportWorks you can

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NewsPlus

Turbo Pascal is now available in a Mac version.

BORLAND'S NEW APPLE II AND MAC SOFTWARE

Borland International has recently introduced a Macintosh version of its popular Turbo Pascal language. Turbo Pascal is the leading Pascal compiler for the IBM PC series. Borland plans to follow the release of Turbo Pascal for the Mac with a version of Turbo Modula-2 for the Apple II series with CP/M. Modula-2 may be the successor to Pascal because it's better suited to developing large, complex programs. For more information, contact Borland at 4585 Scotts Valley Drive, Scotts Valley, CA 95066; (408) 438-8400.

APPLE AND KINKO'S TO SELL EDUCATIONAL SOFTWARE

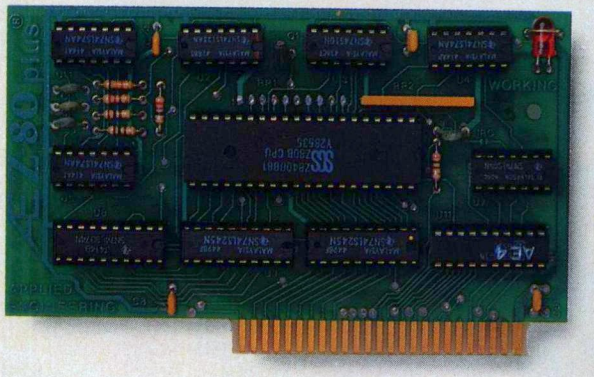
Apple Computer and Kinko's Graphics are planning a joint effort to sell software developed by universities for the Apple II and Macintosh computers. Apple plans to use the 285 Kinko's stores that serve more than 500 colleges and universities across the country to sell software to schools at low prices, generally between $8 and $30. Kinko's also offers a desktop-publishing service called Copy Creation that uses the LaserWriter printer. For information, call Kinko's at (800) 235-6919; in California call (800) 292-6640.

PEAT MARWICK'S MAC UPGRADE PLANS

Peat Marwick, a leading accounting firm, was one of Apple's early Mac customers and an avid supporter of the computer. Since the firm started using Macintoshes in May 1984, about 12,000 of the company's auditors have already racked up 3 million hours on the more than 5500 Macs the company uses around the world. The firm is planning to upgrade its fleet of Macs to the level of the Macintosh Plus without buying the entire upgrade from Apple.

Sources at Peat Marwick say that the company will buy only the Macintosh Plus Disk Drive Kit with 800K drive and ROM from Apple. It will upgrade the internal memory of the computers to one megabyte with an alternative memory upgrade and will either use a non-SCSI hard disk, an internal hard disk such as the Hyperdrive, or an external 800K drive, depending on the storage needs of each user.

With Z-80 Plus,™ run CP/M®–the largest body of software in existence.



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Enter the CP/M world with the new Z-80 Plus card from Applied Engineering, and introduce your Apple IIe® or II+® to the thousands of CP/M programs. Only the Z-80 Plus comes standard with the new 4.0 software, the most advanced system ever for running CP/M programs.

The new 4.0 boasts advanced features like built-in disk emulation for popular memory expansion boards, boosting both system speed and storage capacity. And menu-driven utilities that let you get to work faster. The Z-80 Plus also lets you run older CP/M programs — all the way down to Version 1.6 (2.2 is the most popular).

The Z-80 Plus is the only card on the market capable of accessing more than 64K in an Apple IIe. If you have an extended 80-column card, all 128K is usable, and if you have RamWorks, up to 1088K is available.

Each Z-80 Plus comes with our CP/M Ram Drive software, enabling IIe owners to use an extended 80-column card or a RamWorks card as a high-speed Ram disk which runs CP/M software up to *twenty times faster.* So packages like WordStar and dBASE II run at blinding speed.

Simply plug the Z-80 Plus into any slot in your Apple. You'll get the benefits of two computers in one — all at an unbelievably low price (only $139!).

• Fully compatible with ALL CP/M software • Fully compatible with most hard disks, including Corvus and the Sider • Fully compatible with Microsoft disks (no pre-boot required) • Specifically designed for high speed operation in the Apple IIe (runs just as fast in the Apple II+ and Franklin) • Runs WordStar, dBASE II, Turbo Pascal, Fortran-80, Peachtree and ALL other CP/M software with *no pre-boot* • Semi-custom I.C. and low parts count allows Z-80 Plus to fly through CP/M programs with extremely low power consumption (we use the Z-80B) • Does EVERYTHING other Z-80 boards do, *plus* Z-80 interrupts • Five year warranty

Call to order today, 9 a.m. to 11 p.m. seven days, or send check or money order to Applied Engineering. MasterCard, VISA and C.O.D. welcome. Texas residents add 5⅛% sales tax. Add $10.00 outside U.S.A.

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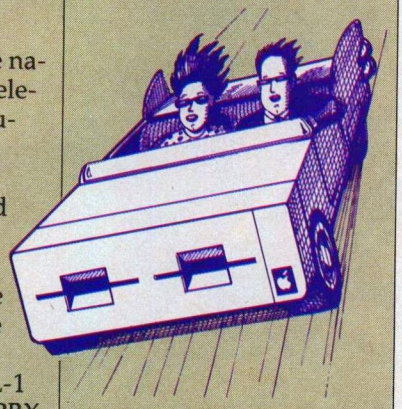
NewsPlus

GM invites Apple IIe users to 'disk drive a Chevy.'

NORTHERN TELECOM INTRODUCES MAC/PBX NETWORK

Northern Telecom, the nation's second-largest telecommunications manufacturer and leading supplier of digital PBX equipment, announced that it will provide a network for the Macintosh that can operate via ordinary telephone lines, using Northern Telecom's Meridian SL-1 and Meridian SL-100 PBX systems in conjunction with the LANSTAR network. More than 17,000 sites already have the SL-1 and SL-100 PBX systems installed, and modifications of existing voice lines can carry Macintosh data as well as voices for about $300 per connection.

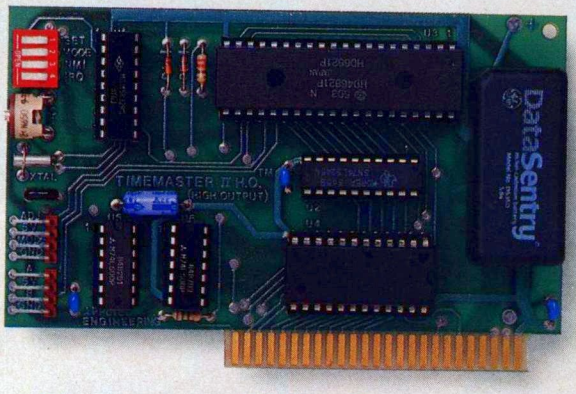
Northern Telecom has demonstrated how the two Meridian digital PBX systems can interconnect Macintoshes and other computers over standard twisted-pair telephone wiring. The Macs were connected to an IBM System 36 minicomputer and to an IBM mainframe host computer that was running 3270 applications. This announcement is part of a series of moves Apple will be making this year to let people know that Macintosh computers can share information with existing equipment, including IBM computers of all sizes. For more information, contact your local Northern Telecom representative, or call Jennifer Lazarus at (408) 988-5550.



DISK DRIVE A 1986 CHEVY

In an unusual promotion, General Motors has developed a software diskette called Chevy Tech for the Apple IIe. It contains a database of 1986 Chevrolet automobiles and their features, as well as other programs such as a financial calculator and a game called Depreciation Derby, in which you race against the clock to get your 12 used cars to the dealer for a trade-in. GM invites Apple IIe users to "disk drive a Chevy" by sending a check for $3 to cover the cost of the diskette and mailing it with a piece of paper with their name and the words "Chevy Tech for Apple IIe" to Chevy Tech, P.O. Box 2054, Warren, MI 48090-2054.

Timemaster H.O.™, the only clock that displays time and date on AppleWorks'™ screens and files.



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It's the smart way to put the time and date on your Apple II+® or IIe®. Because only the Timemaster H.O. packs *ALL* the features of all the competition *combined,* including leap year, year (not just in PRO-DOS), month, date, day of week, hours, minutes, seconds and milliseconds. It's totally PRO-DOS, DOS 3.3, PASCAL and CP/M compatible. And of course, it works better than any other clock with AppleWorks.

If you're using or writing software for other clock cards, you're still covered. Because the H.O. will *automatically* emulate them. And the Timemaster H.O. adds 14 new commands to BASIC. The H.O. even comes complete with two disks full of sample programs, including a computerized appointment book, a DOS dating program, interrupt programs, and over 30 programs that others charge extra for — or don't even offer.

As a low-cost option, you can add true BSR remote control to the H.O., giving you remote control of up to 16 lights and appliances in your home or office.

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Clock price **$129.00**
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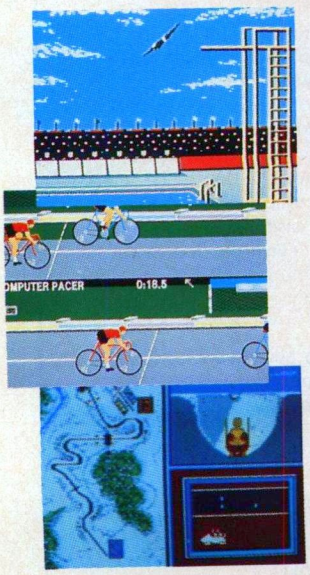

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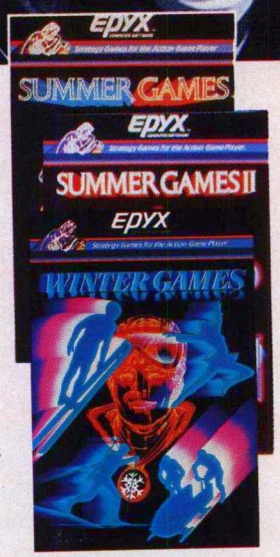
Winter Games	✓	✓		✓	✓	✓



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NewsPlus

The Mac is on the scene in many large companies.

BIG FIRMS JUMP ON MAC BANDWAGON

A host of different companies have thrown their support behind the Macintosh as a serious business computer, and the Mac is now on the scene in many large companies. Here are a few examples of what some well-known companies are doing with their Macs.

Arthur Young has become the second major accounting firm to endorse the Macintosh for use as a primary tool for financial auditing. The firm has invested two years and 50,000 hours in developing and testing a new Macintosh software package called AY/ASQ (Arthur Young/Audit Smarter, Quicker), which company officials claim will incorporate the Macintosh's ease of use into expert-system technology that guides auditors through the audit process, identifies high-risk areas that may require special attention, and presents the auditors with custom-tailored procedures for each situation.

Other corporate Macintosh users include Motorola, with several hundred Macintosh computers that are used for printed-circuit-board layout, project scheduling, tooling design, and other engineering and office-automation tasks; Federal Express, which uses Macs at its Memphis headquarters for graphics, communications, and database applications; and Knight-Ridder Newspapers and Chevron, which are both using the Mac for desktop publishing.

APPLETALK DEVELOPERS ASSOCIATION

The AppleTalk Developers Association (ATDA) was formed recently as a means of furthering the development of products that use the AppleTalk network in conjunction with the Macintosh, Apple II, and IBM PC families of personal computers and also for larger UNIX systems. The members are working on a wide range of products: fileservers, printers, electronic-mail systems, multiuser software, and software for converting information from one brand of computer to another.

Although most of the association's members are working on Macintosh-related products, developers interested in creating Apple II AppleTalk products are also encouraged to join. For more information, contact ATDA, c/o Guy Andre Miriande, Tangent Technologies, 5720 Peachtree Parkway, Suite 100, Norcross, GA 30092. +

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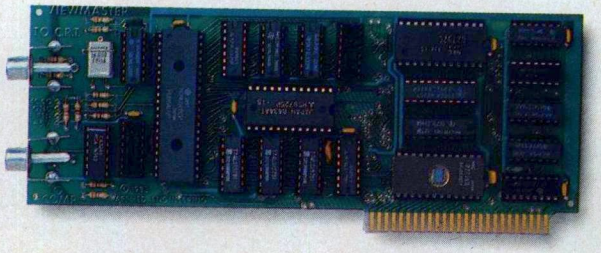

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VIEWMAX 80	✓	✓			✓			✓	
SMARTERM	✓	✓				✓	✓		
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One look at the chart will give you some of the reasons there's only one smart choice in 80 column cards for your Apple. But the real secret to Viewmaster 80's success is something even better: Total compatibility.

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And the Viewmaster 80 delivers a super sharp, state-of-the-art display with a 7×9 character matrix for clear, easily readable characters. Here are just a few of the powerful features the Viewmaster 80 delivers for a great price ($139):

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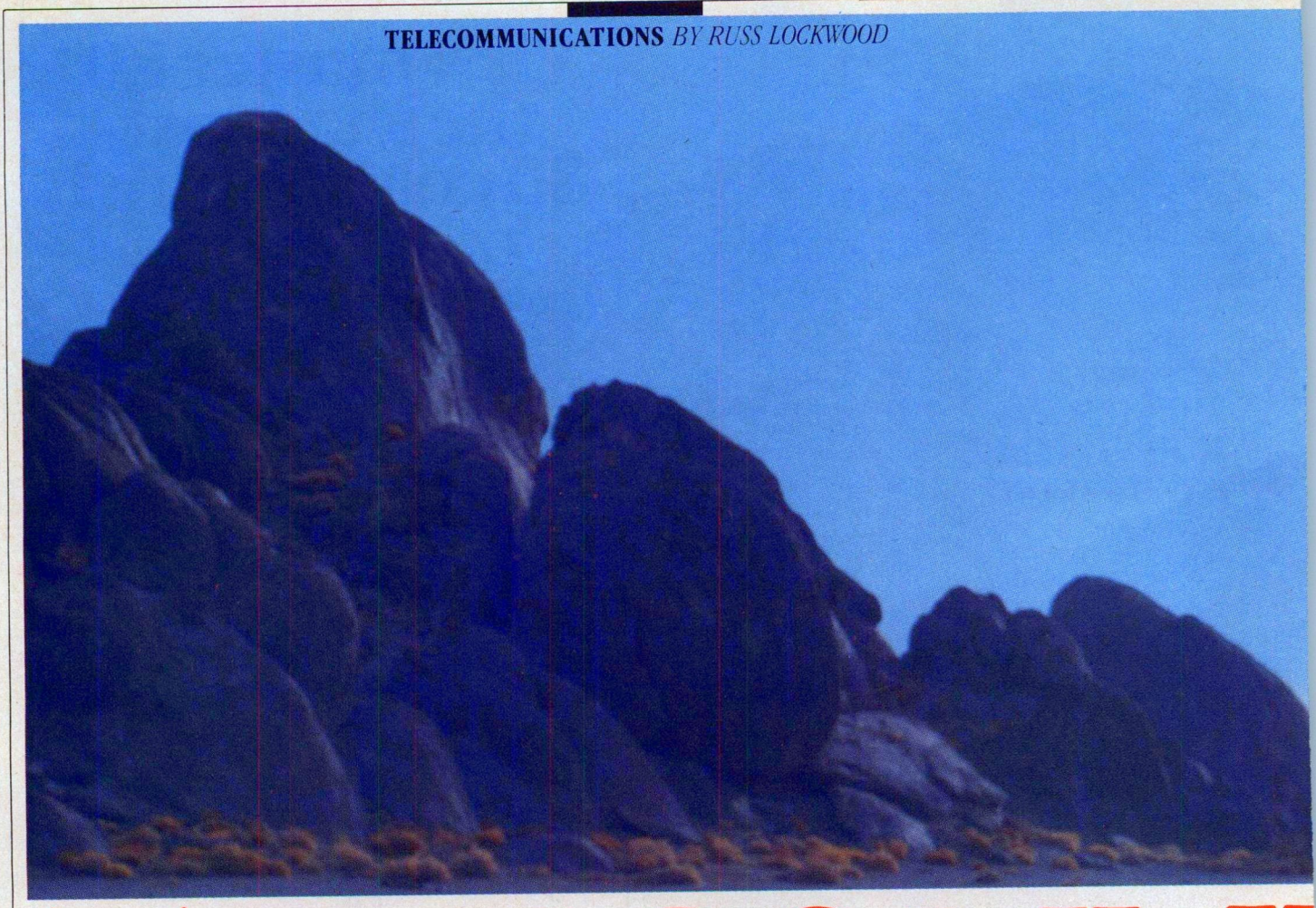


TELECOMMU

Across the country, from boardrooms to living rooms, telecommunications represents one of the hottest topics around. The increased sales of hardware and software products, coupled with a proliferation of on-line services, reflect this trend. A broad spectrum of people is discovering the ease, speed, and convenience of telecommunications.

Bringing the telecommunications world to your desktop requires more than just a modem and a couple of cables (see the following article, "Telecommunications Hardware"). If you want to log onto a service automatically, send and receive files, and perform any one of many other productive functions, you need a telecommunications program to operate your modem.

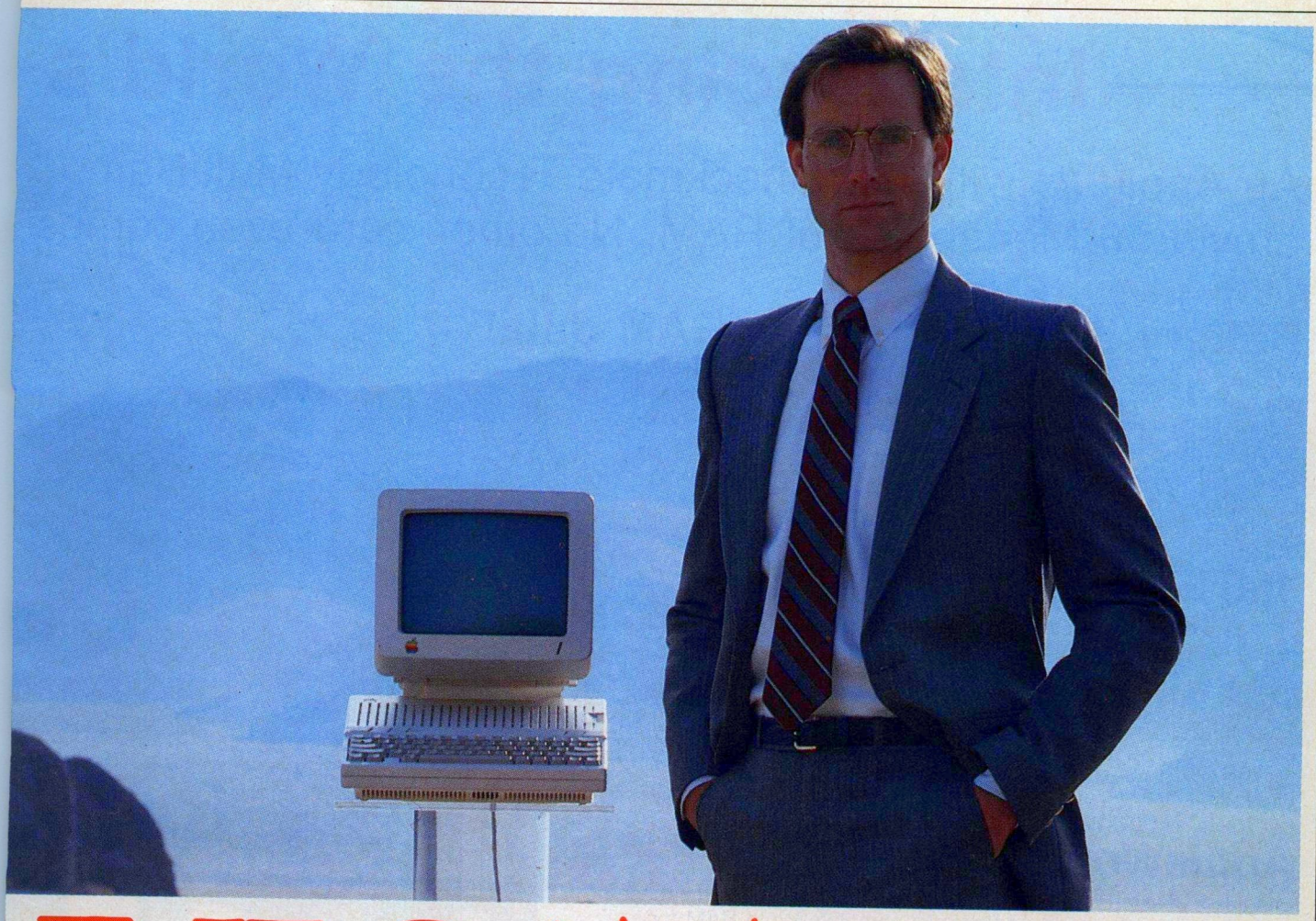
Telecommunications requires certain ground rules that enable two computers to talk to each other. Just as a modem must transmit and receive data on specific frequencies, so the software must agree on specific parameters.

The American National Standards Institute (ANSI) created the American Standard Code for Information Interchange (ASCII), which covers 128 characters, as a common ground for telecommunications. This way, specific bit patterns represent the same characters, whether you are connected to an Apple II, Macintosh, IBM PC, or other personal computer.

Although ASCII forms the basis of telecommunications, several methods of transmitting bit patterns are available. Both transmitting and receiving computers must use the same settings, or else your ASCII messages will turn into hieroglyphics.

The primary settings include speed, usually from 110 to 9600 bits per second (bps); data bits, either seven or eight; stop bits, usually one or two; and parity, usually odd, even, or none. The data bits hold the bit pattern for a particular character, and the stop bits signal the end of a bit pattern. The parity bits are for error checking. Other aspects are line feeds, whether to insert a carriage return at the end of a line or not; echo, whether you need your input to appear on your screen or not; and XON/XOFF, an almost standard technique to start and stop the transmission of characters.

The two types of programs generally available are menu-driven or command-driven. Menu-driven software is easier to learn but takes long-



UNICATIONS Software

This selection of telecommunications software for your Apple II-series and Macintosh computers should help you choose the program that's right for you.

er to use. Command-driven software is harder to learn but faster to use, once you've learned it. Of course, the ideal program lets you switch between the two types, allowing users to evolve from slow, menu-selecting novices to speedy, command-entering experts.

A telecommunications program should allow you to set up default parameters as well as change them quickly and easily. If you own an auto-dial/auto-answer modem, the software should support these convenient features. Several programs redial the phone number when they receive a busy signal. If you've ever wanted to connect with popular bulletin-board systems (BBSs), you will appreciate this capability.

An especially nice feature is the ability to create automatic log-on sequences for your favorite telecommunications services and BBSs. It allows you to congregate the parameters, phone number, identification numbers, passwords, and any other information into one file. Type the filename, and the program does the rest, saving you quite a bit of time and effort. Most programs go one step further and store these files in a directory—literally one- or two-keystroke telecommunications.

CARTER DOW PHOTOGRAPHY

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An Apple //e with the Checkmate Technology MultiRam™ provide 6 Megabytes of RAM. No other card even comes

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Bulti-in port allows up to 2 megabytes of battery-powered RAM to retain files and programs in memory for up to 10 years. Just load your programs (such as AppleWorks) once and you won't need the disk again for 10 years.

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MultiRam™ RGB provides full-color RGB Apple video output.

100% Apple compatible

This card doesn't even take up an expansion slot! It takes the place of the standard 80 column card in the auxiliary slot.

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The MultiRam™ RGB Card has a 65C816 CPU Port allowing the //e to run all existing Apple programs as well as incredibly powerful 16-bit software such as the Lotus 1-2-3 workalike, VIP Professional. This CPU can directly address up to 16 Megabytes of RAM.

AppleWorks power!

Imagine a desktop measured in Megabytes allowing huge databases and spreadsheets. Load AppleWorks completely into RAM for instant response.

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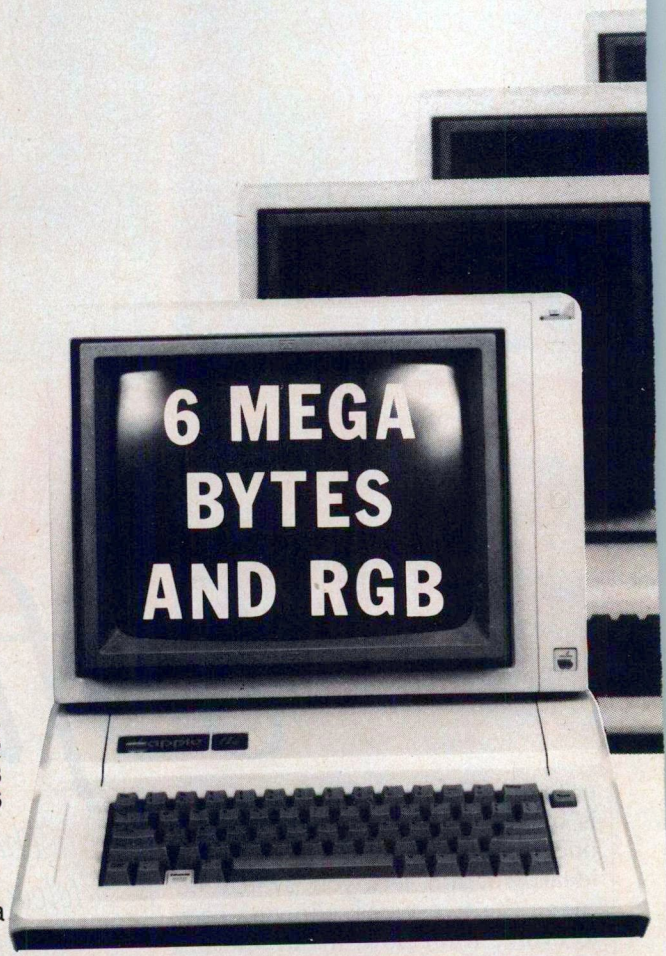
The MultiRam™ RGB's memory can be partitioned to create directories and subdirectories, thereby eliminating the need for a second disk drive for many programs. The optional battery RAM can be used as extra memory or as a super fast disk drive that is reliable even if the power is interrupted. The battery backup allows you to keep the most commonly needed programs and files in memory, ready for instant use.

Memory Capacity

The MultiRam™ RGB Card comes with 64K of DRAM and can be expanded up to 1 megabyte. Optional Static RAM can add up to 2 megabytes. Optional MultiRam + Card can add an additional 3 megabytes. A fully expanded MultiRam RGB Card provides 6 megabytes of memory.

5-Year Warranty

The MultiRam™ RGB is made in the U.S.A. and backed by a 5-year warranty.



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Buy a Checkmate Technology MultiRam™ RGB Card before May 1, 1986 and send us your warranty card and a working RAM card (from any manufacturer) for the Apple //e with at least 8 256K chips installed. We will send, directly to you, a check for $50.00

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RGB Card can be expanded to close to providing that kind of memory.

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Get VIP Professional and MultiRam™ EX Card For $319.95

Unleash the tremendous 16-bit computing power of the 65C816 CPU with VIP Professional, a Lotus 1-2-3 workalike. VIP Professional gives the Apple //e the kind of power and speed essential in business, scientific and educational applications. For a limited time VIP Professional is available with a MultiRam™ EX card for just $319.95 (suggested retail price). See your computer dealer today and move up to 16-bit computing. The MultiRam™ card allows you to run all existing Apple //e software as well as 16-bit programs such as VIP Professional.

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Some programs automatically dial the phone at a designated time and perform predefined procedures. For example, they might call an on-line service every night to send electronic mail or every morning to receive it and save it on your disk.

The whole idea of hooking up to an on-line service is to obtain information. Hence, the program must be able to receive (download) files from a service to your disk drive, printer, or both, and send (upload) your files to the service. If a program lacks this feature, don't spend a penny for it.

Those who intend to upload and download files to and from BBSs may want to make sure the software includes an error-checking protocol called Xmodem. Created by Ward Christensen, Xmodem is available in the public domain and on many telecommunications programs. Other protocols are available, but Xmodem is the dominant one.

Data you send and receive with Xmodem can be formatted in various ways. Most Macintosh telecommunications programs use the new MacBinary standard proposed by Dennis Brothers. It is a binary transfer designed to ensure that all the information necessary to reproduce a file with its Macintosh attributes, such as the file's icon, are sent to the receiving computer.

Some programs keep your on-line session in a memory buffer, allowing you to scroll backward to find information. Although it isn't an absolute must-have feature, it comes in handy on occasion.

All commercial telecommunications programs come with a manual to explain the subtleties of the software, but you shouldn't overlook on-line help. Little reminders during program operation go a long way toward making the software easy to use.

Although buying a modem and a program is usually a two-step process, some manufacturers bundle software with the modem itself. For example, both Hayes Microcomputer Products and Prometheus Products offer a package deal on their 1200-bps modems, cable, and software. The advantage of getting a complete telecommunications system right out of the box—with software guaranteed to run with the hardware—cannot be emphasized enough.

On the other end of the spectrum, you can buy a modem and spend a modest amount for separate software. Any Apple users' group worth its membership fee should have a variety of public-domain telecommunications programs in its library. Of course, the quality of such programs, like that of other public-domain programs, ranges from terrific to awful. Still, those on a tight budget and with knowledge of programming can gain valuable software at an almost negligible cost.

The wide variety of telecommunications software available makes choosing a particular program difficult. To help you decide, here is a selection of software for your Apple II-series and Macintosh computers that will do the trick.

APPLE II

Apple Access II

Designed specifically for the IIe and IIc, this menu-driven program provides a solid foundation for your telecommunications needs. It looks a lot like AppleWorks in that it places note cards over other cards to show where you are in the program. Apple Access II automatically dials and answers the phone, lets you create automatic log-on sequences, and provides upload and download capability with error checking. It also lets you print files and offers on-line help.

Perhaps its most interesting feature is a specialized programming language that enables you to create complex telecommunications programs. Your imagination is the limit as you set up files, automate modem operation, and explore the potential of setting up your own BBS. The lack of a text editor requires you to write the program with a ProDOS-based word processor, however.

Apple Access II does not come with back-scrolling capability and cannot automatically redial a phone number when it's busy. The 200-page manual, complete with step-by-step examples, does a fine job of explaining how to use the program.

Apple Term II

Apple Term II is free. That's right, free. All you have to do is buy a 300-bps or 1200-bps Apple Modem, and Apple Computer, Inc. throws in this "modem utility program" for 64K IIe and IIc computers for free.

Frankly, it isn't much of a program. It has no automatic log-on, upload, download, or backward-scrolling capabilities. It does store and automatically dial up to a dozen telephone numbers and also works with a printer, so you can have a printout of your on-line experience.

That's about all there is to Apple Term II. The menu-driven program is easy to use and offers a good starting point for newcomers to the telecommunications world.

ASCII Express

If you are stranded on a desert island and can have only one telecommunications program, ASCII Express should be the one you have. In billing it as "the most sophisticated communications software available for the Apple," United Software is certainly complying with the truth-in-advertising law.

ASCII Express has been around for a while. The result is a polished, professional program with just about everything you have ever wanted in a telecommunications program: upload, download, remote operation, exceptionally powerful automatic log-on sequences, character suppression and filtering, error checking, backward scroll, and auto-dial/auto-answer—and the features go on and on and on.

The price for such a powerful program is that it suffers in the ease-of-use category. It does take some time to learn. Beginners will probably stick to the menus, and advanced users can go on to issue commands directly.

Take a good look at ASCII Express. It is possibly the closest you can get to an ideal program.

Data Capture IIe

As the title says, the program is best for downloading data from another computer. It is unprotected and written in BASIC, which makes it a prime candidate for modification by those with the inclination and necessary programming skills.

Data Capture IIe is menu-driven, although experienced users can quickly advance to issuing commands. It is simple to operate, and the documentation does a good job of explaining how to download, merge, and print out information.

The program lets you create automatic log-on sequences (up to 40 characters long) and has on-line help. It supplies neither error check-

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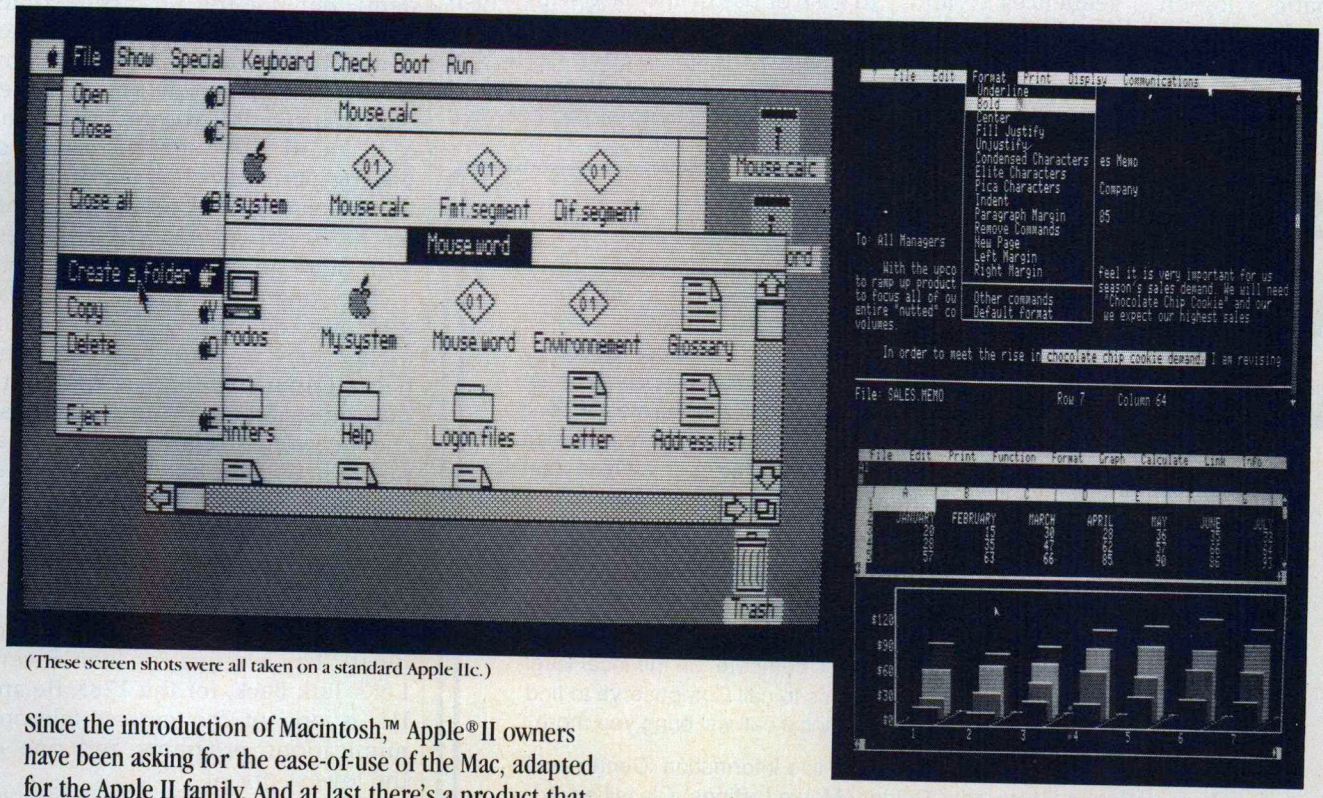

(These screen shots were all taken on a standard Apple IIc.)

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CIRCLE 191 ON READER SERVICE CARD

ing nor automatic-redial capability, though.

EasyCom/EasyGo

More than just a cute name, EasyCom/EasyGo comes with a long background of solid performance. It supports uploading and downloading of files, automatic dialing, automatic log-on sequences, and unattended operation—all the features a good telecommunications program should have. It also comes with a built-in word processor that puts the simple text editors of other telecommunications programs to shame. Granted, it is not in the same league as WordStar, but it does justify, move, delete, and center text.

On the dark side, IIc owners with Apple Modem 300 or 1200 who use the ProDOS version of this program may wonder whether the title refers to ease of use or the ease with which an extra $20 slips out of your wallet. Evidently, the connecting cable that comes with the IIc fails to connect the carrier-detect signal pin between the IIc and modem. EasyCom/EasyGo requires that pin. No pin, no signal, thus no program operation. For $20, Transend supplies a cable adapter to make the program work.

Era-2

Available for the Apple IIe and Macintosh (in a version called MacModem), but not the IIc, Era-2 comes bundled with a 300/1200-bps modem. The big pull is MNP, a communications protocol for error-free data transfer. Microcom is pushing MNP hard, even to the extent of placing parts of it in the public domain. Telenet and Uninet already offer MNP service to selected cities, with more on the way.

The menu-driven program features user-defined parameters, automatic log-on sequences, on-line help, terminal emulation, and auto-dial/auto-answer. You can also change your communications parameters while connected to another computer. Era-2 is a competent telecommunications program.

Let's Talk Back

Finally, the telecommunications industry has a retort for Joan Rivers. Let's Talk Back, for the 128K IIe and IIc, is one of the newest telecommunications programs and one of the lowest-priced.

The program features automatic dialing, uploading and downloading of files, and recording of information to disk. It includes automatic log-on sequences and can send information to a printer.

Do not confuse Let's Talk Back with another program, Let's Talk, also by Russ Systems, which is a messaging-system program (see "Messaging Systems," *A+*, September 1985, pages 53–57).

Modem Magician

Gary Little, who is no stranger to *A+* readers, offers a homemade telecommunications program for your II-series computer. Do not let the word *homemade* fool you, for Modem Magician packs in features that you'll normally find only in programs that cost far more.

The menu-driven program features uploading and downloading, in addition to support for the Xmodem error-checking protocol; data memory buffer; and four utility programs to convert Apple Pascal, Applesoft,

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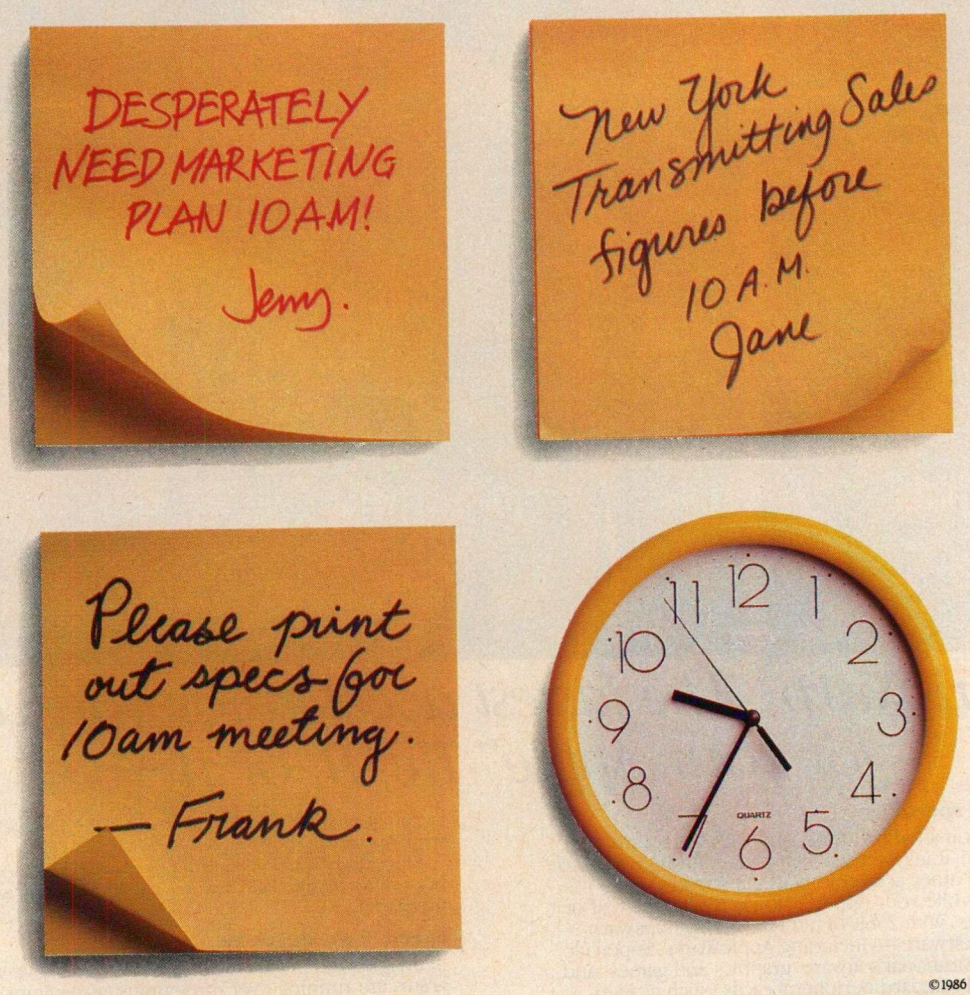

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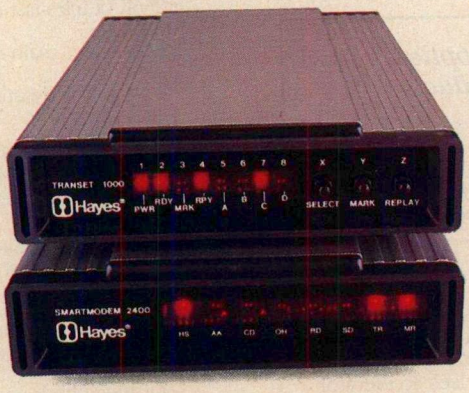

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Integer BASIC, and binary program files into text files. It also has automatic dialing and printer support and keeps an on-line directory of phone numbers. Although automatic log-on sequences are not available per se, you can create and assign macros (called command phrases) to specific keys for fast entry of ID numbers and passwords.

All in all, Modem Magician is a well-executed program and certainly sports a very competitive price.

Modem 7

If you've installed a CP/M board in your Apple, then Modem 7 is a good program to pick up. It is in the public domain, so the cost is negligible. On the other hand, it has undergone so many modifications and improvements that you might have a hard time figuring out which version you want. Modem 7 is an oldie, and still a goodie, that should be available from your users' group.

Person-to-Person

Booting up Person-to-Person makes you think your 128K Apple IIe or IIc computer just transformed itself into a Macintosh. The program makes full use of the mouse- and icon-driven environment. The result is an easy-to-use product with a lot of visual appeal.

Person-to-Person's manufacturer, Trutec, bills the product as an integrated communications program with telecommunications, database, and word-processing functions. Information is stored on "cards," with a maximum of 1500 cards per file. Each card holds up to 512 characters.

The program requires a mouse, and the point-and-click method of selecting settings and functions is smooth and fast. It includes uploading and downloading, auto-dial/auto-answer, automatic log-on sequences, and printer support. About the only nit to pick is the need to place a greater-than sign after a phone number to change from Voice to Terminal mode. Neglecting this step results in an attempt to hold a one-sided conversation with a carrier tone.

Person-to-Person is a competent telecommunications package. The word-processing and database functions are solid additions to the package, although neither competes with a dedicated program.

pfs:Access

The pfs series of programs set a new standard for ease of use, and menu-driven pfs:Access is no different. Remember, though, that the trade-off for simplicity is power. Although it performs well enough, this software may not offer all the bells and whistles you need.

The program stores up to eight telephone numbers, automatically dials the phone, and performs automatic log-on sequences. It provides backward scrolling, on-line help, and printer support, but does not include auto-answer, error checking, or automatic redial.

On the positive side, pfs:Access is well integrated with the other programs in the pfs series, and transferring data is a snap. On the negative side, the pfs series is so tightly integrated that you must use pfs:Write (the word-processing program) to upload and download files. Evidently, pfs:Write stores files differently than other word-processing pro-

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grams do, and pfs:Access looks for that particular format.

If you use the pfs series, then pfs:Access should be your choice for a telecommunications program. If not, you probably want to pass it by.

TermExec

If you've ever doubted the wisdom of menu-driven software, then TermExec is for you. It is command-driven, which makes it ideal for experienced users but difficult for beginners.

The advantage of getting a complete system right out of the box cannot be emphasized enough.

Apple IIe and IIc owners will find that the program can work in an 80-column format, but II Plus owners will have to settle for 40 columns.

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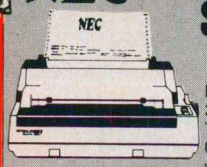

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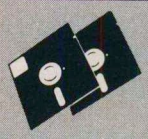

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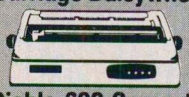

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The program features auto-dial/auto-answer, remote operation, backward scrolling, uploading and downloading, error checking, and printer support.

Creating an auto-log-on sequence is interesting. You put the program in the Learn mode and perform an actual log-on sequence, and TermExec records your commands.

Another interesting feature is a "timed" set of instructions that executes your commands at some point in the future, even if your Apple does not have a clock card. Instead, the program uses the 6502 microprocessor—a rather neat software solution.

Terminus

Quark, known for its excellent Word Juggler word-processing program, also markets a telecommunications program called Terminus. In fact, the two are designed to work together. Unlike the pfs series, Terminus allows you to manipulate files from other word-processing programs as well.

This software includes all the appropriate features: uploading, downloading, auto-log-on sequences, and auto-dialing, to name a few. A first-class text editor, patterned after Word Juggler, is also included. In fact, you can load Terminus directly into RAM while using Word Juggler and toggle between the two programs with a keystroke.

A note to owners of older IIcs: The faulty crystal in early models ran slower than industry-standard specifications. As a result, some modems and telecommunications software failed to work properly, and Terminus was one such program. If you received the free hardware upgrade from Apple, then ignore this concern. If you did not, you need an upgrade for your IIc to work properly with Terminus.

Write Away

Write Away is a word-processing program with a built-in telecommunications module. It is DOS 3.3-based, so IIcs and ProDOS-equipped IIes need not apply.

It includes two modes: Deferred, which allows you to issue commands; and Immediate, which lets you use a line-oriented text editor. On the whole, this dual modality can be clumsy as you switch back and

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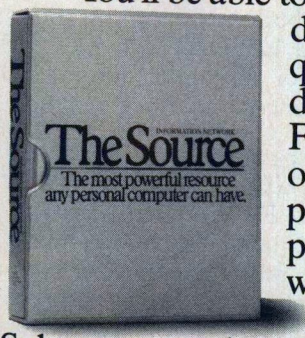

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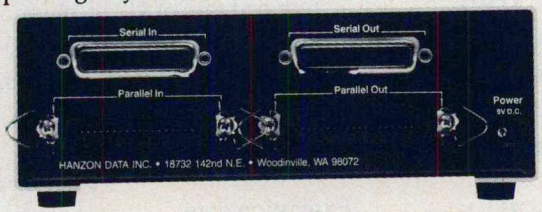

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forth, issuing commands, typing a line of text, and then issuing more commands.

Write Away auto-dials/auto-answers, performs automatic log-on sequences, uploads, and downloads. IIe owners with a Thunderware Thunderclock board can issue timed instructions that perform functions at a set time.

MACINTOSH

InTouch

This powerful and versatile program for the Macintosh is relatively easy to learn and use. It uses the pull-down menus to good effect, and establishing a connection is a simple matter of point-and-click.

The InTouch program performs all the functions you would expect in a top-notch telecommunications program, including uploading and downloading of ASCII or binary files, terminal emulation, and auto-dial/auto-answer.

A built-in Communications Command Language provides a flexible tool for setting up automatic log-on sequences and other macros.

Mac Mail Telecom

Aegis Development, known for its MacChallenger space-shuttle simulator, bills Mac Mail Telecom as "an affordable, versatile, and solid communications program," which is a reasonable description.

It uploads and downloads files using both the Xmodem and MacBinary protocols, uses auto-log-on sequences, includes auto-dial/auto-answer/auto-redial, and features unattended operation. It can work with a printer, has VT-52 and VT-100 terminal emulation, and includes a text editor.

Mac Mail Telecom also provides an address-book database with limited sorting and the ability to create mailing labels.

MacTEP

Macintosh-history trivia question: Name the first telecommunications program for the Macintosh.

Answer: MacTEP (Macintosh Terminal Emulation Program).

MacTEP was written in Microsoft-BASIC by Dennis Brothers in January 1984. Instead of selling his creation, Brothers put it in the public domain. It appeared in February

1984 on the MAUG SIG (special-interest group) on CompuServe. Needless to say, by this time a multitude of programmers have made extensive modifications and improvements to it.

Although certainly not as polished as commercial programs, MacTEP performs adequately enough.

MicroPhone

After two years of feedback from MacTEP users, Dennis Brothers has released his polished commercial program MicroPhone. It sends and receives files with the Xmodem protocol and the MacBinary format (which Brothers proposed); uses auto-log-on sequences; offers auto-dial, auto-answer, and auto-redial; works with printers (including the LaserWriter); and lists macros and services you want to dial in pull-down menus.

Initially you may want to use pull-down menus and use single-keystroke macros later. You can build macros by using the Watch Me mode, in which the program automatically records the other computer system's prompts and your keyboard responses. The program saves the session, and you can assign a character to invoke the macro sequence.

The program includes a Start-up mode, in which an entire session from log-on to sign-off is executed automatically after you insert the MicroPhone disk or, on a hard disk, after you double-click on the MicroPhone application.

You can copy MicroPhone onto a hard disk (a master key disk is not necessary) and select the volume in which MicroPhone will receive files during file transfer. The program includes a text editor (as a desk accessory), Switcher, and a Switcher configuration file for MacWrite and MicroPhone.

MicroPhone is a powerful program designed for both experienced and novice communicators. As its name implies, it is a software instrument that allows your computer to communicate easily with other computers.

MacTerminal

MacTerminal provides basic telecommunications functions. It uploads and downloads files, offers a full array of communications settings, automatically saves information to disk, includes backward scrolling, and supports a printer.

Define your needs first, then select the software.

The program has no auto-log-on or macro features, however, and does not redial when the line is busy. It uses a special version of the Xmodem protocol. Unless you must have this particular program, shy away from MacTerminal.

Those pioneers among you who own Lisa computers may want to examine LisaTerminal, a telecommunications program that is similar in function to MacTerminal but runs only on a Lisa.

Mite/Mac

The original Mite gained fame in the IBM PC arena. Obviously, Mycroft Labs hopes to strike gold in the Macintosh market as well.

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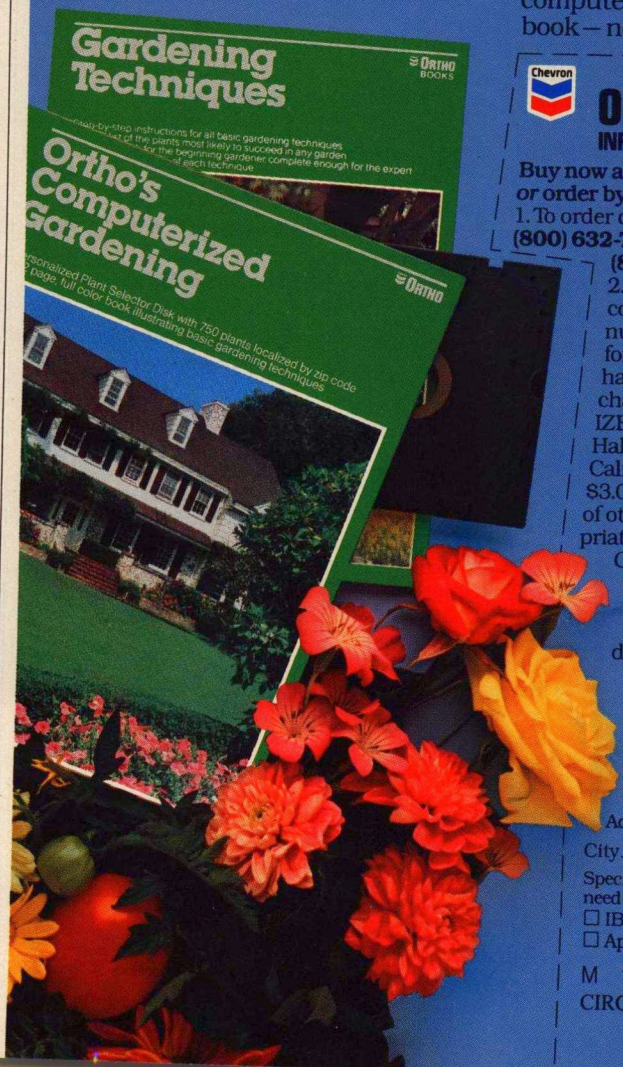

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Mite/Mac offers all the features and functions you expect in a telecommunications program, including auto-dial/auto-answer, auto-log-on sequences, uploading, downloading, and binary-file transfer. It makes full use of the Macintosh's mouse- and icon-driven environment:

ProCom-M

Prometheus Products bundles its ProCom-M telecommunications software with its ProModem 1200 and 2400 modems, and you can also purchase the program separately. ProCom-M works with any Hayes-compatible modem.

Like most Macintosh programs, ProCom-M uses the mouse- and icon-driven environment to good effect, relying heavily on pull-down menus. The program's 150-page manual does a fine job of explaining program operation.

The program features auto-dial/auto-answer; easy-to-change parameters; auto-log-on sequences; uploading and downloading of ASCII or binary files; a phone-number directory; and a phone log that keeps track of the date and length of your phone calls, as well as the phone numbers. A page-setup function allows you to prepare a text file for printing once you are off-line. On-line help is always available.

ProCom-M is a powerful program and contains all the features and functions you expect in a telecommunications program. If you are looking for a complete all-in-one package, a Prometheus ProModem 1200 or 2400 with ProCom-M is an excellent choice.

Red Ryder

Contrary to popular opinion, Red Ryder is not a public-domain program, although you obtain the program free from a users' group or download it from the MAUG SIG on CompuServe. It costs $40, comes with a "45-day evaluation period," and includes instructions on how to make programmer Scott Watson a happier and wealthier man.

It boasts of a large number of features, including a multitude of parameter settings; backward scrolling; auto-log-on sequence; auto-dial/auto-answer/auto-redial functions; and uploading and downloading with the "standard" Xmodem, MacTerminal's version of Xmodem, MacBinary, and Kermit protocols.

Macintosh owners who want a bargain-basement price on a boutique of a program should take a serious look at Red Ryder.

Smartcom II

Smartcom II, from the modem giant Hayes Microcomputer Products, packs a multitude of features into one of the easiest-to-use telecommunications programs you can find. Hayes is bundling Smartcom II with a modem, in this case a Smartmodem 1200.

The program includes auto-dial/auto-answer/auto-redial, a complete set of parameters from 110 bps to 19,200 bps, printer support, uploading, downloading, automatic log-on sequence, directory, error checking, the MacBinary protocol, and on-line help.

Perhaps the most exciting feature is that you can get interactive on-line graphics between 512K Macintoshes running Smartcom II. The program functions much like MacPaint: You

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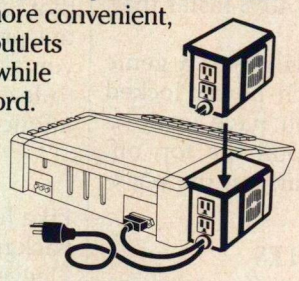


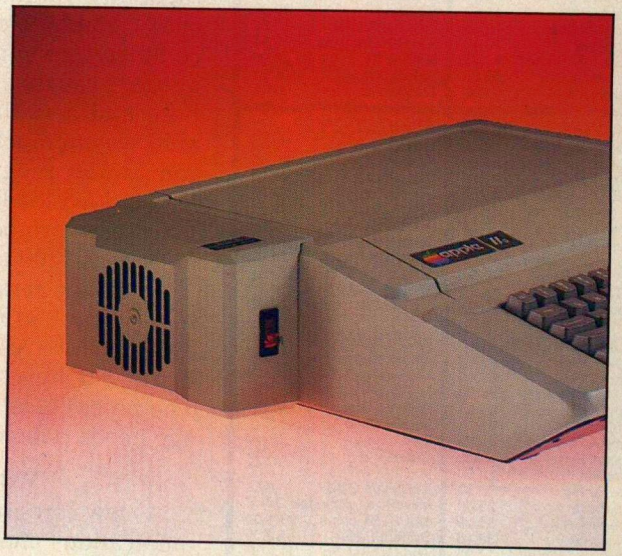
System Saver solves power line problems.

Impurities in the power supply cause 70-90% of all microcomputer malfunctions. Line noise can be interpreted as data, confusing your Apple and causing annoying system errors. Power surges and spikes can do costly damage to your computer's delicate circuitry.

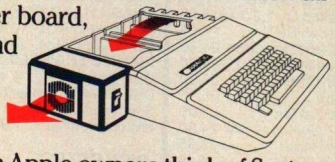
System Saver clips surges and spikes at a safe level and filters out line noise. It makes your Apple more accurate, more efficient and more reliable.

System Saver keeps your Apple cool.

Peripheral cards added to your Apple not only generate heat, they block any natural air flow through the computer. The resulting high temperature conditions can potentially shorten the lives of both your Apple and your peripheral cards.



System Saver's quiet fan draws a breath of fresh air across the Apple's mother board, over the power supply and out the side ventilation slots at the rate of 17 cubic feet per minute.



More than 1/4 million Apple owners think of System Saver as the piece Apple forgot. And 1/4 million well-protected Apples agree. Available at your local dealer. For more information, contact Kensington Microware, 251 Park Avenue South, NY, NY 10010, (212) 475-5200 Telex: 467383 KML NY.

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can transfer images to and from the Clipboard and integrate all images into MacPaint and MacWrite files. Incidentally, an interactive chess game using this feature is included with the program.

Exchanging text *and* graphics is a big step in the right direction, and Smartcom II is right at the forefront of the telecommunications revolution. This outstanding program deserves your attention.

Telescape

One of the most powerful programs on the market offers a virtual cornucopia of features and functions—if you can figure out how it works. The problem is the manual, or, rather, the horrendous excuse for one. Unless a revised version becomes available, Mainstay should bundle two aspirin with each program.

Yet everything you want is in this program. Highlights include use of Xmodem and MacBinary for uploading and downloading, auto-log-on capability, rudimentary (and proprietary) graphics exchange, the most complete terminal-emulation language available, password protection, and a rudimentary electronic-mail system much like a BBS. A nifty companion program, Turbo Download, downloads files, using the MacBinary protocol, 40% faster than normal at 1200 bps.

Telescape reminds me of a genie in a bottle—so much power locked away inside. All you have to do is figure out how to pull the top off. The potential is great, but the package needs polish.

MODULES

A few programs offer telecommunications modules as part of a larger package. Usually, telecommunications is not the priority module, yet the capability might be satisfactory for your needs.

Jeeves

AppleWorks, the top-selling integrated package, now has its own personal software butler named Jeeves, a program that resides out of sight until you need it (see "Jeeves vs. Pinpoint" in this issue). Then, with a press of a key, out it pops, providing, among other services, a phone dialer with a directory.

It can store numbers up to 17 digits long and can pause to access alternate long-distance services. Note that you need an "interrupting source" (AppleMouse IIe, ThunderClock, ProClock, Timemaster II, or the $15 PBI Interrupt board) for Jeeves to work with AppleWorks.

That is about all there is to the telecommunications capability of Jeeves. It is a simple phone dialer. The big advantage is that you need not exit from AppleWorks to call.

Jazz

Listening to all the hype ("The software Macintosh was invented for," say the ads) may lead you to believe Jazz is Lotus' gift to Mackind. Maybe, maybe not. In the area of telecommunications, definitely not.

Setting the parameters is confusing, using the program is worse, and the manual suggests you consult an expert. No auto-log-on sequence, no macros, no auto-redial, clumsy screen buffering, and convoluted binary file transfer mark an odyssey into telecommunications that may leave a user frothing at the mouth.

About the only positive aspect of the telecommunications module is the ability to perform Jazz-to-Jazz transfers relatively efficiently.

If you see MacTerminal as a limited program, then you will think Jazz is even more constricted. It is so bad that Lotus should refund one-fifth of the price to each purchaser. Unless you absolutely, positively need Jazz-to-Jazz transfer, forget this telecommunications module.

Pinpoint

Like Jeeves, Pinpoint operates in the background of AppleWorks (see "Jeeves vs. Pinpoint" in this issue). Unlike Jeeves, it offers quite a few more options than auto-dialing.

Pinpoint allows you to enter macros, upload and download files (without an error-checking format), and auto-answer. In fact, the telecommunications module turns out to be a gem and well worth a look. The outstanding, well-illustrated manual deserves an award for its crisp, clean, and clear instructions on operating the program.

Pinpoint also sells the Pinpoint Toolkit so you can write your own "desktop accessories." It includes specifications, a library of development aids, and source code. How do you make a great program better? Let the programmers tinker with it!

CIRCLE 137 ON READER SERVICE CARD

Let's compare Apples™ to Apples™.

An Apple IIc

An Apple IIc with Z-RAM

The Apple IIc on the right works exactly the same as the Apple IIc on the left. Almost. The Apple on the right has a powerful memory expansion coprocessing card called Z-RAM. From Applied Engineering. Which means the Apple on the right can completely load AppleWorks into RAM—and then run it up to thirty times faster than the Apple on the left.

Z-RAM also acts as a solid-state disk drive. Which means the Apple on the right will load and store programs up to 30 times faster. And, our included RAM disk is compatible with Applesoft, PRO-DOS, DOS 3.3, PASCAL and CP/M.

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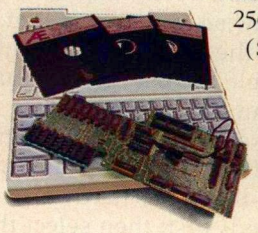
Even a 256K Z-RAM can completely load AppleWorks into RAM. With Z-RAM, the moment your fingers touch the keyboard AppleWorks responds. A 256K Z-RAM lets your IIc run AppleWorks up to 30 times faster, increases available desktop to 235K and maximum number of records from 1,350 to over 15,000, quadruples the number of lines allowed in the word processor, provides a print spooler, and auto-segments large files so they can be saved on two or more disks. A 512K Z-RAM boosts AppleWorks desktop to an incredible 425K.



Take a closer look.

There's more. Z-RAM has a built-in high speed Z-80B microprocessor that allows you to run CP/M programs. Which means you now have access to the single largest body of software in existence, including popular packages like WordStar, dBase II, Turbo PASCAL and Microsoft BASIC. A 16 bit option is also available.

And still more. Z-RAM is compatible with all IIc software and hardware, installs easily in just ten minutes with a screwdriver (slightly longer without), is available with 256K or 512K of additional memory (a 256K Z-RAM can be upgraded to 512K at any time). Z-RAM is easily handled by the IIc power supply with our patent pending power saving design.

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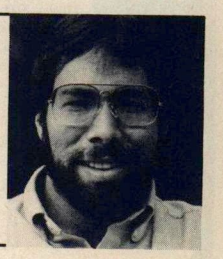
> *"I recommend Applied Engineering products whole-heartedly." (Of course, Steve's IIc has a Z-RAM installed.)*
>
> *Steve Wozniak, the creator of Apple Computer*



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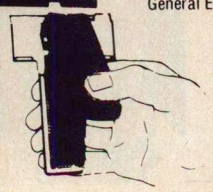

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Sidekick

The MacTerm function is a barebones telecommunications module within Sidekick. In its limited capacity, it uploads and downloads ASCII files and provides an auto-dial feature. It includes a directory and allows you to connect to a BBS or online information service while running another application program. Sidekick does not have Xmodem or a binary protocol.

Sidekick is simple, quick, and handy. Its telecommunications module is an added extra to an already terrific program.

SwyftCard

A small, multipurpose circuit board that plugs into slot 3 of your Apple IIe, SwyftCard has a word-processing program built in. This what-you-see-is-what-you-get text editor lets you send highlighted text to a modem in slot 2 with a single keystroke. Any incoming text automatically goes into your document. SwyftCard lets you save a document of up to 40K to an unformatted disk in less than eight seconds (see "The Race Goes to the Swyft," *A+*, November 1985, pages 86–90).

Which One Is for Me?

These capsule descriptions have pointed out the highlights that will help you decide which program is right for you. For a more in-depth look, contact the company. If possible, try out the software. Most local computer stores worth their salt will demonstrate programs for you. Users' groups are also a good source.

All the programs do about the same thing: transfer data. The difference is in the features and the way the program operates. A program that fails to include a feature you need is not worth the disk it comes on. Likewise, a program that comes with all the features you want but is impossible to use gives you more grief than it is worth.

The key is research. Selecting the right software is just as important as picking the right hardware. Define your needs first; then select the software that matches or exceeds those needs. The result will be a frustration-free entry into a telecommunications world that delivers speed, convenience, increased productivity, and a wealth of information. +

PRODUCT INFORMATION

APPLE II

Apple Access II
Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
List Price: $75
Requires: Apple II Plus, IIe, or IIc; 48K RAM

Apple Term II
Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
List Price: Included with Apple modems
Requires: Apple II Plus, IIe, or IIc; 48K RAM

ASCII Express
United Software Industries
1880 Century Park East, Suite 311
Century City, CA 90067
(213) 556-2211
List Price: $129.95
Requires: Apple II, II Plus, IIe, or IIc; 48K RAM

Data Capture IIe
Southeastern Software
7743 Briarwood Drive
New Orleans, LA 70128
(504) 246-7937
List Price: $90
Requires: Apple IIe or IIc; 128K RAM

EasyCom/EasyGo
Transend
2190 Paragon Drive
San Jose, CA 95131
(408) 946-7400
List Price: $129
Requires: Apple II, II Plus, IIe, or IIc; 128K RAM

Era-2
Microcom, Inc.
1400A Providence Highway
Norwood, MA 02062
(617) 762-9310
List Price: $499 (includes modem)
Requires: Apple IIe; 128K RAM

Let's Talk Back
Russ Systems
320 Dufour Street
Santa Cruz, CA 95060
(408) 427-1540 (voice)
(408) 427-0310 (modem)
List Price: $59
Requires: Apple IIe or IIc; 128K RAM

Modem Magician
RMS Software
#210-131 Water Street
Vancouver, B.C., Canada V6B 4M3
(604) 681-3371
List Price: $38
Requires: Apple II, II Plus, IIe, or IIc; 48K RAM

Person-to-Person
Trutec Software
P.O. Box 407
El Cerrito, CA 94530
(415) 525-4901
List Price: $65
Requires: Apple IIe or IIc; 128K RAM

pfs:Access
Software Publishing Corporation
1901 Landings Drive
Mountain View, CA 94043
(415) 962-8910
List Price: $70
Requires: Apple IIe or IIc; 128 RAM

TermExec
Exec Software
201 Waltham Street
Lexington, MA 02173
(617) 641-2930
List Price: $95
Requires: Apple IIe or IIc; 128K RAM

Terminus
Quark
2525 West Evans, Suite 220
Denver, CO 80219
(303) 934-2211
List Price: $89
Requires: Apple IIe or IIc; 128K RAM

Write Away
Midwest Software Associates
1160 Appleseed Lane
St. Louis, MO 63132
(314) 997-6470
List Price: $175
Requires: Apple II, II Plus, IIe, or IIc; 64K RAM

MACINTOSH

InTouch
Palantir Software
12777 Jones Road, Suite 100
Houston, TX 77070
(713) 955-8880
List Price: $145
Requires: Macintosh

Mac Mail Telecom
Aegis Development
2210 Wilshire Blvd., Suite 277
Santa Monica, CA 90403
(213) 306-0735
List Price: $59.95
Requires: Macintosh

MacModem
Microcom, Inc.
1400A Providence Highway
Norwood, MA 02062
(617) 762-9310
List Price: $599 (includes modem)
Requires: Macintosh

MacTEP
Available in the public domain from CompuServe's MAUG SIG and various users' groups
List Price: NA
Requires: Macintosh

MacTerminal
Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
List Price: $99
Requires: Macintosh

MicroPhone
Software Ventures Corportion
2907 Claremont Avenue
Suite 220
Berkeley, CA 94705
(415) 644-3232
List Price: $74.95
Requires: Macintosh

Mite/Mac
Mycroft Labs
P.O. Box 6045
Tallahassee, FL 32314
(904) 385-1141
List Price: $195
Requires: Macintosh

ProCom-M
Prometheus Products
45277 Fremont Blvd.
Fremont, CA 94538
(415) 490-2370
List Price: $99
Requires: Macintosh

Red Ryder
Available as "freeware" from users' groups and CompuServe's MAUG SIG
List Price: $40 (after a 45-day evaluation period)
Requires: Macintosh

Smartcom II
Hayes Microcomputer Products
P.O. Box 105203
Atlanta, GA 30348
(404) 449-8791
List Price: $149
Requires: Macintosh

Telescape
Mainstay
28611B Canwood Street
Agoura Hills, CA 91301
(818) 991-6540
List Price: $125 (Turbo Download, $39.95 separately or $10 for Telescape owners)
Requires: Macintosh

MODULES

Jeeves
PBI Software
1155B-H Chess Drive
Foster City, CA 94404
(415) 349-8765
List Price: $49.95
Requires: Apple IIe (enhanced) or IIc; 128K RAM

Jazz
Lotus Development Corporation
161 First Street
Cambridge, MA 02142
(617) 577-8500
List Price: $595
Requires: Macintosh

Pinpoint
Pinpoint Publishing
Box 13323
Oakland, CA 94661
(415) 530-1726
List Price: $69 (Pinpoint Toolkit, $49.95; both, $100)
Requires: Apple IIe (enhanced) or IIc; 128K RAM (256K RAM for Toolkit)

Sidekick
Borland International
4585 Scotts Valley Drive
Scotts Valley, CA 95066
(408) 438-8400
List Price: $84.95
Requires: Macintosh

SwyftCard
Information Appliance
530 University Avenue
Palo Alto, CA 94301
(800) 982-5600
in CA (800) 562-7400
List Price: $89.95 plus shipping and handling (includes hardware and software)
Requires: Apple IIe, one disk drive

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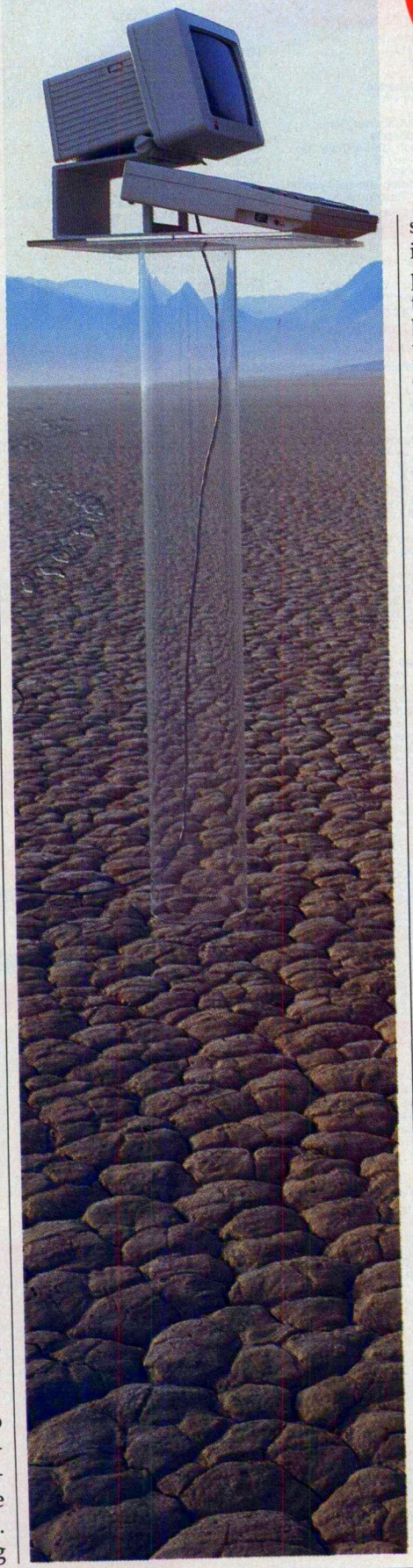

CARTER DOW PHOTOGRAPHY

The key to unlocking telecommunications' long-distance power is a modem, a device that allows your Apple to communicate with another computer over common telephone lines. It translates the digital signals of your computer into the analog signals the telephone system recognizes. A modem at the other end of the line converts the analog signals back into digital form.

This process is called modulation-demodulation, and a modem derives its name from what it is: a MOdulator-DEModulator. It modulates digital signals into analog signals and then demodulates them back again.

Modems generally use either synchronous or asynchronous communication. Synchronous modems organize data into one long stream. Precise timing (synchronization) is required to separate the characters. Asynchronous modems, on the other hand, bracket each character with special bits and transmit the data in irregular bursts; hence, communication does not require precise synchronization. The vast majority of modems for personal computers are asynchronous.

Long-Distance Chaos

A computer creates digital signals by using bursts of voltage, representing on and off (1 and 0). These binary electrical signals must be precise, since any deviation causes errors in the data.

On the other hand, the telephone system transmits analog signals, which carry information over the lines by using fluctuating electrical voltage that reacts to changes in sound pressure. The louder you talk into a telephone, the higher the voltages in the line.

Both types of signals run into problems during long-distance transmission. The longer the distance between communication points, the weaker and more distorted the signal. Eventually, both digital and analog signals fade into unrecognizable static. The telephone company solves the problem by using special analog filters and amplifiers that select and boost a limited bandwidth of comprehensible voice-communication frequencies. The system discards signals outside this range of 300–3300 Hz.

Unmodulated digital signals receive a hostile welcome from the telephone lines. The filtering and amplifying blur the precise signals, general line noise mimics digital pulses and produces echoes, and if a signal falls outside the 300–3300-Hz range, it is discarded. All these factors add up to distorted transmissions.

To correct these problems, a modem changes digital signals into audio tones and transmits them over specific frequencies. Just as different voltage bursts in a computer represent on and off (1 and 0), so a modem uses different audio frequencies to duplicate on and off patterns.

Since telecommunication is usually two-way, a modem uses two sets of tones to distinguish the data it transmits from the data it receives. Furthermore, to coordinate the tone frequencies, one modem acts as a signal originator, and the other acts as a signal answerer.

Figure 1 shows the frequencies used by the most common type of modem (AT&T Bell 103 standard). The technical term for this modulation-demodulation technique is Frequency Shift Keying. The signal originator transmits at one pair of frequencies, which is the exact receiving frequencies the signal answerer expects. Notice that when the signal answerer sends data to the originator, the two sets of transmitting and receiving frequencies also match up (see page 48).

The proper term for simultaneous, two-way data transmission is *full-duplex*. As you may have guessed, one-way data transmission is called half-duplex. Just about all Bell 103

MUNICATIONS Hardware

A buyers' guide to understanding, choosing, and using modems—the keys to your long-distance power

standard modems are full-duplex.

The data you send over a telephone line uses a code called ASCII, short for American Standard Code for Information Interchange. Each transmitted character (letter, number, punctuation mark, or symbol) is made up of seven bits, has two more framing bits to tell each computer when the bit pattern for a character starts and stops, and may include one or two parity bits for error checking. All told, a single character can be up to 11 bits long.

The speed of a modem is measured in bits per second (bps), more commonly referred to as baud. Actually, baud is something of a misnomer, referring to the number of signal events per second. When the term *baud* describes serial communications, then one baud equals one bit per second. When *baud* describes a 16-bit parallel bus, for example, then one baud equals 16 bps, since each signal event carries 16 bits. Although *baud* remains a popular term, bits per second (bps) is the proper label for comparing transmission speeds.

Back in the days of the Teletype machine, transmission speed was a languid 110 bps, roughly 10 or 11 characters per second. The Bell 103 standard transmits at a maximum of 300 bps, or roughly 30 characters per second.

Data-transmission speeds of 300 bps are possible with the Frequency Shift Keying modulation technique. Faster two-way communications place some of the rapidly shifting frequencies outside the limited bandwidth of 300–3300 Hz, however, which raises a problem, because analog telephone equipment discards signals outside this range.

To meet the need for higher speed, AT&T introduced the Bell 202-standard modem. Although technically a full-duplex modem, it allows 1200-bps transmission in only one direction. The return channel is only 5 bps, which is practically useless for transferring long files. Although the Bell 202-standard modem is cumbersome (and obsolete), you can use it for half-duplex telecommunications. In this case, both parties must take turns sending data at 1200 bps.

Racal-Vadic and AT&T

A major breakthrough came in late 1972, when Racal-Vadic introduced a full-duplex 1200-bps modem, the VA3400, that used a digital/analog conversion technique called Phase Shift Keying. With this technique, as before, one modem functions as the signal originator, and the other is the signal answerer.

The signal originator transmits a constant signal at 2250 Hz, and the signal answerer transmits a constant signal at 1150 Hz. Instead of changing frequencies (as in Frequency Shift Keying) to represent 1s and 0s, Racal-Vadic shifts the phase (the peak and trough) of the sound wave. In effect, it changes the starting point of this sound wave to represent a 1 and lets the wave continue to represent a 0.

In 1976, AT&T introduced its own full-duplex 1200-bps modem with a new Bell 212A standard. The modem uses a variation of the Phase Shift Keying technique in which the signal originator transmits at 1200 Hz and the signal answerer transmits at 2400 Hz, a scheme roughly opposite to that of Racal-Vadic's VA3400.

Most 1200-bps modems use the Bell 212A standard, and most 300-bps modems use the Bell 103 standard. The VA3400 and Bell 202 protocols, although obsolete, are not extinct. Indeed, many information services offer compatibility. Bell 212A is significantly more popular than either of them, though.

The rest of the world does not recognize the Bell 212A standard. Instead, by treaty, other countries have settled on an incompatible standard called V.22, put forth by the Consultive Committee on International Telephone and Telegraph (CCITT). It uses a different modulation technique that operates on different frequencies.

Enter the 2400

Modem technology, just like the technology of other computer hardware, is becoming more and more sophisticated. The old barrier of 1200 bps has been surpassed by new 2400-bps technology. More than a dozen companies have introduced 2400-bps modems, and others will follow.

The new 2400-bps modems use a variation of Phase Shift Keying called Quadrature Amplitude Modulation, which varies the amplitude (height and depth of the wave) and changes the starting point of the analog sound waves. *Quad* refers to the four positions where the wave starts: the top of the wave, the bottom of the wave, midway between the top and bottom on the up side, and midway between the top and bottom on the down side. In effect, the modem crams 2400 bits into a signal space that used to have 1200.

Unlike 300- and 1200-bps modems, which use the Bell 103 and 212A standards respectively, 2400-bps modems have no Bell standard. Although there seems to be some consensus about the use of adaptive equalizing techniques to preserve signal quality and prevent errors, most manufacturers are rallying around the CCITT V.22 standard. Only time will tell whether it becomes a North American standard, but with most manufacturers offering compatibility, V.22 is off to a good start.

Breaking the Sound Barrier

Should we expect 4800-bps modems by Christmas and 9600-bps modems next April Fools' Day? Just what is the bps barrier of voice-grade telephone lines?

A small start-up company called Telebyte Technology, of Greenlawn, New York, claims to have developed a new modem that transmits at 4800 bps. The company has developed a patented mathematical algorithm that monitors and subtracts noise on the line between the two modems.

Meanwhile, Digital Communications Associates of Alpharetta, Georgia, has surpassed Telebyte by offering a 10,000-bps modem called Fastlink. It uses a proprietary technique called Dynamically Adaptive Multicarrier Quadrature Amplitude Modulation, which generates hundreds of tones, each at a different frequency. Fastlink monitors the tones, adjusts them, and encodes them with bits of data, after which it forms the data into packets, links the packets together, and transmits the entire assembly. How fast is it? A 1200-bps modem takes 44 minutes to send a 320K file. Fastlink does it in 5.

Your choice should reflect your needs, meeting your current requirements and allowing for future growth.

Before you rush right out to buy this $2395 technological marvel, however, know that Fastlink is aimed primarily at the IBM PC market. Apple software has not yet been modified to work with the modem. DCA claims you can hook the modem to an Apple and transmit at the higher speed, although such "blind data dumps" do not provide feedback on possible transmission errors. DCA is investigating pairing the modem with an Apple and is looking into having a software company modify a telecommunications program.

Speeds faster than 10,000 bps are a possibility. The theoretical maximum over analog lines lies somewhere between 25,000 and 33,000 bps, depending on the technique the modem uses to modulate the carrier wave. By the time modems reach that speed, digital circuits should be in place, however, obviating the need to have a modem in the first place.

AT&T Bell 103 Standard
Full duplex, 300 bps
Frequency Shift Keying Modulation

		Transmit	Receive
Signal Originator	On (1)	1270 Hz	2225 Hz
	Off (0)	1070 Hz	2025 Hz
Signal Answerer	On (1)	2225 Hz	1270 Hz
	Off (0)	2025 Hz	1070 Hz

Figure 1: The frequencies the most common type of modem (AT&T Bell 103 standard) uses.

Indeed, certain Bell operating companies are experimenting with a digital system that has had some success in Europe. The Integrated Services Digital Network would make modems obsolete, since you would not need a modulator-demodulator device. Before you call up your local Bell company, though, keep in mind that this network probably will not become generally available for a long time. Even then, you will probably need a hardware device to access the network. Still, the system offers a real speed advantage, and 56,000 bps is within reach.

A Port of Call

Back to reality, the last item you need in order to place your Apple in touch with the telecommunications world is an RS-232C serial port. In 1969, the Electronics Industry Association adopted RS-232 as a standard for serial communication between data-terminal equipment (computers) and data-communications equipment (modems). RS-232C stands for Recommended Standard 232 Version C and is indeed the industry-standard port for telecommunications.

Among other things, RS-232C calls for a 25-pin connection between modem and computer and specifies which signal each pin carries. Thus, pin 1 is a ground, pin 2 transmits data, pin 3 receives data, and so on.

The more-or-less-standard connector to the RS-232C port is called the DB-25. It derives its name, in part, from its D shape, which makes for a perfect fit the first time and every time.

Most modems do not send signals through all 25 pins—ignoring pins is perfectly acceptable because the RS-232C standard defines uses for many pins that provide features that not all modems require. Many modems can function by using only pin 2 (transmit data), pin 3 (receive data), and pin 7 (signal ground).

Finally, the modem must be connected to the telephone system, which you often accomplish by plugging the line from the modular phone jack on the wall into the modem. In more than a few cases, novice telecommunicators have neglected to perform this step, which has made the initial results far from satisfactory.

Modem Features

Now that you understand the fundamentals of how modems operate, what features should you look for? Choosing a modem takes as much time and effort as choosing a printer or monitor does—certainly the costs are roughly the same. As always, your choice should reflect your needs, meeting your current requirements and allowing for future growth. Contrary to marketing claims, many people just do not need the fastest, fanciest, or costliest modem around.

Speed

Basically, you can choose from 300-bps, 1200-bps, and 2400-bps modems. A higher-speed modem often also includes the electronic circuitry for the lower speeds. Thus, one of the most popular combinations around is the 1200/300-bps modem.

A 1200-bps modem is four times as fast as a 300-bps modem. Likewise, a 2400-bps modem is twice as fast as a 1200-bps modem. Clearly, if you routinely transmit and receive long files and the business axiom "time is money" applies, the higher speed is highly desirable.

On the other hand, a 2400-bps modem for playing games on a consumer telecommunications service represents overkill. If you are using The Source to "chat" or CompuServe to play MegaWars, a 300-bps modem works just fine. Most people do not type 30 characters a second, and waiting around for the mainframe to perform your command does not take advantage of that super speed at all.

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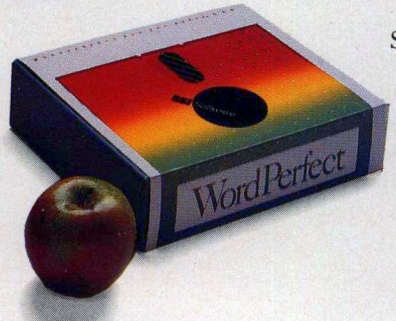

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Add the consideration that most telecommunications services charge extra for using faster speeds, and you end up spending quite a bit of money for a marginal increase in speed.

Also remember that the modem at one end of the line has to be the same speed as the one on the other end. A 10,000-bps modem cannot directly connect with a 300-bps modem at 10,000 bps—it needs to go down to 300 bps.

For the home, 1200/300-bps modems represent the best price/performance ratio in the market. Prices are dropping fast, 300 bps is acceptable for interacting with a telecommunications service, and 1200 bps is fast enough for most file transfers.

For the home, 1200/300-bps modems represent the best price/performance ratio.

Businesses should seriously consider moving up to 2400/1200/300 bps, especially if they send files regularly. Most 2400-bps modems also contain the circuitry for 1200-bps and 300-bps communications. The added speed is well worth the added price.

Type

Modems come in two types: acoustic and direct connect. Acoustic modems were the first on the market, in part because AT&T held a monopoly on direct connection into the telephone system. The handset of the phone fits snugly into two rubber cups—one holds a speaker to generate tones, and the other holds a microphone to receive tones sent by the modem at the other end of the line.

Direct-connect modems bypass the telephone entirely. You plug the line from the modular jack on the wall directly into the modem.

Direct-connect modems are by far the better buy. Acoustic modems are notorious for picking up external noise, which results in transmission errors. Many of the handsets on newer telephones do not fit into the cups, which increases the risk of errors. Although direct-connect modems are generally more expensive than acoustic modems, the improved signal quality is worth the extra cost.

Many direct-connect modems provide a second jack on the modem itself for hooking up the telephone, letting you use either the modem or the telephone. This handy arrangement relieves you of the chore of plugging in and unplugging the telephone every time you want to use the modem.

Internal vs. External

The internal/external debate is one of those that has no clear-cut answer. Both types of modems have numerous advantages and disadvantages, so the choice is really one of personal preference.

Internal modems are expansion boards that fit into an expansion slot inside your computer. External modems reside outside the computer, connected via an RS-232C port and a cable. An internal modem tucks neatly away inside the system unit; is automatically transported with the computer; and requires no serial port, modem cable, or external power supply. On the other hand, it takes up a valuable expansion slot, increases internal heat, shows no external lights, and cannot work with a variety of computers (you cannot use an Apple

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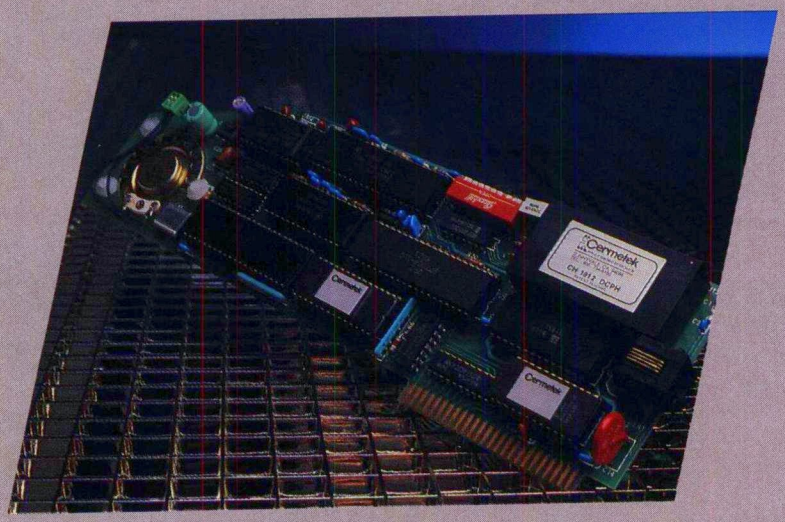

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II internal modem with your Macintosh, for example).

An external modem is easy to use with other computers, has lots of indicator lights, has a power on/off switch for instant reset, and includes DIP switches for special use. On the negative side, it requires desk space, a power adapter, a cable between computer and modem, and a special serial-communications card (or serial-communications capability on a multifunction card).

You may want to give additional consideration to an external modem only because of compatibility with various systems. If you upgrade from one computer to another, you won't have to upgrade the modem too. An external modem generally costs more than an internal one, however, even if you buy through a mail-order house.

Voice/Data Jacks

Many direct-connect modems (internal and external) include two modular phone jacks—one for data transmissions and one for a voice line. The smarter modems automatically switch between the two, although most change with the flick of a switch.

Duplex

Half-duplex, or one-way, communication has generally been superseded by full-duplex, or two-way, communication. Unless you need a modem for specialized use that requires only half-duplex operation, stick to full-duplex.

Automatic Response

Auto-dial and auto-answer are two of the more popular features of a modem. With the old acoustic modems, you had to dial the number by hand, but newer, smarter modems allow you to dial numbers through the software from the keyboard. The modem mimics the tones of the phone to call out. Likewise, the modem can automatically answer the phone, recognize the tones, and begin appropriate procedures.

Software

Many modem manufacturers bundle software with their modem—a welcome touch that saves you the added expense of buying a separate program. Some programs do not offer as many features as others, however, and you may want to upgrade sometime later on.

If software is not bundled with the modem you buy, go out and purchase it. You absolutely need telecommunications software to run a modem. A

If software is not bundled with the modem you buy, go out and purchase it.

local users' group can give you a copy of a public-domain program, but it probably won't do as much as commercially available software. "Telecommunications Software," the first article in this issue, gives you information on what abilities to look for in telecommunications software and includes capsule reviews of popular programs.

The Mainframe Connection

Right now, 2400 bps seems to be the state-of-the-art speed for microcomputer modems, with 4800 bps and 9600 bps looming over the horizon. Yet telecommunications with mainframes, special modems, and leased phone lines passed that speed barrier long ago. The advanced (and

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expensive) modems propel data at speeds up to 19,200 bps.

You can gain the speed benefits of these sophisticated modems if you are willing to foot the cost of the modems and the expense of leasing a dedicated telephone line from the phone company. Such a full-time, private line is called a leased line. The basic level of quality you can expect is termed 3002; better-quality lines are rated C-1, C-2, and so on. Higher speeds increase the probability of transmission errors, so anything less than a leased line is data suicide. Businesses that want high-speed communications should be prepared to dig deep into their pockets to foot the costs of leased lines and high-speed modems.

Telecommunications Tolls

Hardware and software prices cover a wide range. A quick look through the advertisements of mail-order houses reveals that many 300-bps modems, which perform an admirable job of accessing telecommunications services, cost less than $100, and some models from major manufacturers cost a little more than $50. Add the cost of a cable, roughly $20, and you are ready to access the world.

On the other hand, a feature-packed modem can cost you several hundred dollars. You must decide what you need. For the home, where telecommunications is still more of a luxury than a necessity, 300 bps is a good starting point—inexpensive and fast enough for occasional use—but you may find it more economical over the long run to buy a 1200/300-bps modem.

Businesses and professionals probably need more speed, and a 1200/300-bps modem should be the absolute minimum. The new 2400/1200/300-bps modems are relatively fast, but, at this time, the scarcity of emplaced hardware and acceptable high-speed links makes them a longer-term investment. Just about all of them include 1200- and 300-bps capabilities, though, so if you buy now, you will not have to upgrade in the immediate future. Falling prices, increased sales, and wider use by on-line services will make 2400-bps modems an ever more attractive investment over the next year.

Don't forget that you need a serial card with an RS-232C serial port. Many multifunction cards include one as standard equipment. If you don't have one, you must purchase

An entire long-distance world awaits you —all of it as far away as your Apple and modem.

and install an expansion card with an RS-232C serial port before you can use a modem.

To use a modem, you must use a telephone line, and that means paying long-distance charges just as if you had called someone. The usual rules apply: Calling during business hours incurs the most expensive tolls, and calling after 11 P.M. local time gets you the cheapest rate. Yes, you can put a big dent in your pocketbook by calling all the marvelous bulletin-board systems and information utilities across the country.

You can use alternate long-distance services such as MCI and Sprint, but your software and hardware need to be able to pause and recognize the second dial tone that sounds when you connect with the network. Otherwise, the modem will start to transmit the phone number, log-on sequence, and other data before you enter the network, which results in a telecommunications tangle.

Fortunately, to avoid long-distance charges and help prevent transmission errors, most on-line services allow access through dedicated telecommunications networks that operate local trunk lines. Tymnet and Telenet, two network giants, provide a high-quality communications link to most of the major on-line services, including CompuServe and The Source.

Unfortunately, these local trunk lines are sometimes not so local. Often, especially in remote areas, you'll still run up charges because the phone number lies outside your local calling range. Also, some services charge you a premium for accessing them through other telecommunications networks. All things considered, however, going through a network is generally less expensive than calling the service directly.

Lest you forget, accessing telecommunications services costs money. The services usually charge by the hour, and their rates can be from $2 to $300. Before you sign up, ask for in-

formation. Most send a packet that extolls their virtues and tells you the rates. See "Telecommunications Outlook" following this article for more information.

Logging Off

Buying a modem requires a careful analysis of your present and future telecommunications needs. Once you figure out what you are going to use the modem for, then you can look for one with the features that will make your work and play easier at a price that will fit your budget.

An entire long-distance world awaits you—all of it as far away as your Apple and modem. *A+* examines and reports on this world, with special sections such as this one and a regular telecommunications column, yet to read about it is not to experience its speed, ease, and convenience. Once you tap into it, you'll realize how you can improve productivity, research topics, and just plain relax. And the best part is that it's only a phone call away. +

Russ Lockwood is a free-lance writer and former assistant editor at Creative Computing *and staff writer for The New York Times Information Service.*

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Sunnyvale, CA 94088
(408) 752-5000
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Digital Communications Associates
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Alpharetta, GA 30201
(404) 442-4000

Hayes Microcomputer Products
P.O. Box 105203
Atlanta, GA 30348
(404) 449-8791

Micom Systems, Inc.
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Microcom, Inc.
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82 Second Avenue SE
New Brighton, MN 55112
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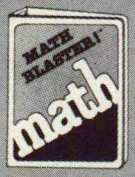

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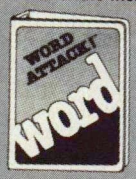

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An on-line crystal ball

TELECOMMUNICATIONS OUTLOOK

The allure of telecommunications rests on power: the power to produce, the power to create, and the power to enjoy. From an executive who pulls company reports off an on-line database to a kid who plays MegaWars over CompuServe, telecommunications offers people the opportunity to extend their range quickly and easily. Those who use it appreciate it; those who don't are at a disadvantage.

Unfortunately, users of telecommunications are definitely in the minority. Overall, modems have achieved only an 8%–10% market penetration, although modem manufacturers are probably ecstatic that the market is wide open. Various analysts predict that modem sales will jump 30% per year, as more and more people learn about the benefits of telecommunications.

A survey of 440 organizations by The Market Information Center notes that 80% of those sampled plan to add modem products during 1986. The leading vendors? Racal-Milgo, Universal Data Systems, Hayes, Codex, and AT&T, although more than 40 companies were mentioned by name. What are the organizations looking for? Quality first and service second.

As for speed, although manufacturers are pushing 2400-bps modems, buyers are not responding. These modems are far more expensive than 1200-bps modems, 2400-bps on-line services are not readily available in most areas of the country, and most services charge quite a bit more for 2400-bps service than 1200-bps service. The industry-analysis firm Future Computing estimates that 2400-bps modems comprise only 5% of total modem sales.

On the home front, modem prices are falling fast, placing 1200 bps within reach of many and making 300-bps modems especially appealing. Add in the free sample of on-line services that comes with most modem purchases, and you can get a great deal. Falling software prices do not hurt either.

Industry analysts also expect more and more people to subscribe to on-line telecommunications services. More than 2500 databases are available, and the industry grew to more than $2 billion at the end of 1984. The Information Industry Association notes that on-line businesses were growing at a 25% to 27% annual rate. Business Communications Company has issued a prediction of 23% average annual growth for the on-line industry through 1990, with revenues of $6.263 billion. Communications Studies and Planning International, Inc., on the other hand, forecasts slower growth: only 13% per year through the end of the decade, with revenues of $5.3 billion.

Picks for '86

What will capture the fancy of the telecommunications world during 1986? Who can tell? Yet dusting off my crystal ball reveals some of the topics I think will be hot during the year.

Home Banking. *American Banker*, a trade publication, has estimated that about 33,000 people used personal computers to handle banking transactions in 1984—numbers sufficiently large to attract several major banks. So far, 18 home-banking programs are in full commercial operation, and another 25 test programs are under way. As noted in the February 1986 issue of *A+*, Steve Wozniak set up a IIc as a dedicated home-banking terminal.

Electronic Tax Returns. The IRS already has test programs set up in Raleigh-Durham-Fayetteville, North Carolina; Phoenix, Arizona; and Cincinnati, Ohio. Only approved tax-preparation services will be allowed to file your electronic returns, and the only one that has received permission so far is H&R Block. Note that H&R Block is the parent company of CompuServe. Look for a tie-in the distant future. Whether or not this type of service will decrease the time it takes to get a refund or reduce the number of returns lost or shredded is another story. Nevertheless, it's a great idea.

Junk E-Mail. Telemarketing was a $52.6 billion industry in 1985 and is expected to grow to a $73 billion industry in 1986—not bad for an analog-based system. "Think digital and prosper" may be the motto of the next generation. Reaching hundreds of thousands of customers—the demographics of those with computers and modems must be outstanding—in seconds appeals to marketers. It may not appeal to the subscribers, though.

CD-ROMS. An encyclopedia on a disk the size of a 45-rpm record is a wonderful idea. A compact-disc-based encyclopedia is here now, although on the telecommunications side of things, downloading a database onto a CD-ROM is not. Already, Information Access Company publishes two databases—a general index covering 1000 magazines and newspapers, and a legal index to more than 700 legal publications—on CD-ROMs. Look for other on-line services to respond. Further in the future, we'll see monthly updates via modem.

Avalanche of Bills. Congressmen are going to vie with each other to produce the most incredible assortment of bills covering electronic telecommunications. At least two are already up for consideration: The Computer Pornography and Child Exploitation Prevention Act of 1985 and the Electronic Communications Privacy Act. The former, which increases surveillance of telecommunications, drew the ire of the ACLU, CompuServe, BBS operators, and the Videotex Industry Association and had to be rewritten. The latter, which seeks to increase privacy, has more support.

Wireless Modems. The ESTeem Model 84 modem ($995 plus $40–$100 for antenna) from Electronic Systems Technology of Kennewick, Washington, transmits data over the airwaves, using FM frequencies. The range is three miles or less, depending on blocking terrain. Don't worry—a radio can't pick up data transmissions, and even eavesdroppers with a Model 84 tuned to the correct frequency will have difficulty intercepting them. Nevertheless, the company is bringing out a data-encryption scheme based on National Bureau of Standards requirements. This setup sounds like an outstanding alternative to a local-area network.

—Russ Lockwood

Why Are Apple Owners So Loyal?

People who have the best often are, but in the case of Apple there's more. Apple owners think back to how Apple got started in 1977, just two people working out of a garage and what happened is the talk of Wall Street and the computer industry as well. Many like the fact that Apple only makes computers. Unlike their competition they don't make typewriters, copiers or telephones. They do just one thing and that's one reason they do it so well.

At Applied Engineering we think the same way. You see, Applied Engineering is the only major hardware manufacturer totally dedicated to the Apple computer. Whereas most of our competitors must divide their customer support and engineering time between IBM, Atari, Radio Shack or other computers, our engineers only design products for the Apple. This dedication allows us to be much more familiar with the Apple and the people who use them.

We don't expect you to buy an Applied Engineering peripheral on loyalty alone, but when you compare our products to those made by QUADRAM, MICROSOFT, AST and others you'll find out why Applied Engineering means a quality design, innovation, craftsmanship and total Apple compatibility.

The other guys do pretty well considering how busy they are with IBM. But at Applied Engineering, ALL of our work involves the Apple. In fact, all of our employees were Apple owners before they came to work for us. The people in shipping, engineering, quality control, order entry, all use Apples at work and at home.

This one track mindedness of ours allows us to offer the largest storage with AppleWorks and most other programs and our Z-80 card includes the new 4.0 operating system. We can expand the Apple IIe to over 5 MEGABYTES of memory and we've got clock cards, accelerator cards, music cards, A to D converters, digital controllers, and a BSR system so your Apple can control your whole house with no additional wiring!

Applied Engineering recognizes that we've got to do a better job than our IBM counterparts because we know you're smarter than the average computer buyer, you bought an Apple. You see, our competition has it a little easier, their customers aren't as smart as you. After all, they bought the wrong computer.

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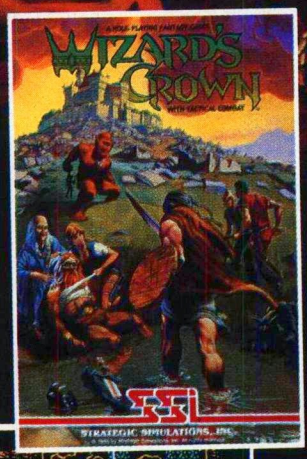

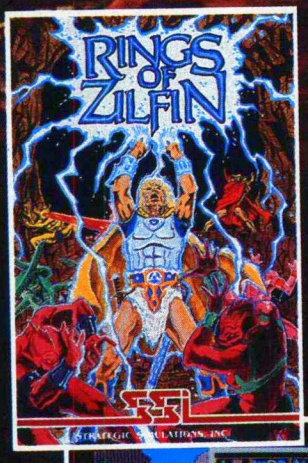

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CIRCLE 131 ON READER SERVICE CARD

AppleLink

Apple's new electronic information system keeps Apple users in the know.

Ever had a problem with your Apple? What do you do when you can't figure out how to change the switches on your ImageWriter printer from Apple IIe to Macintosh settings and you can't find the information in the manual? Well, you can try calling your Apple dealer. Until now, you may have found such a call to be a frustrating experience. If your dealer has begun using AppleLink, however, things are likely to improve.

AppleLink is an electronic tie between Apple and its dealers. Dealers can find information in libraries (databases), or they can use electronic mail to contact Apple's support centers for answers to specific questions. A joint project between Apple Computer, Inc., and General Electric Information Systems Company of Rockville, Maryland, AppleLink lets dealers use Macintoshes with software that lets them access General Electric's large network and mainframe computers, on which is stored essential sales and technical information for dealers. Libraries include up-to-the-minute news from Apple, as well as information on compatibility between Apple's and third-party products, product specifications, and solutions to common problems.

Apple has designed the software so that accessing information is easier than it is on any other database I've seen. Dealers connect to the network and can access a variety of information (see figure 1). Opening a library of information involves only the proverbial point and click on the icon.

Let's take the example at the beginning of this article. After connecting to the network, your dealer opens the Technical Information library. A Search dialog box asks the dealer to enter criterion search words (see figure 2), after which the system executes the search in a matter of seconds and lists documents containing relevant information (see figure 3). You can open and save or print them. The entire process from connection to opening the final document for such a search took me about two minutes.

Apple subsidizes the dealers' use of AppleLink, giving each location two hours of free use each month. After they use the free hours, dealers pay $15 an hour. Most dealers call a local number for access to the network, which means they don't additionally have to pay for a long-distance phone call. AppleLink was introduced to Apple dealers in late July 1985, and Apple expected 100% dealer participation by the end of March 1986. So if you have a problem with an Apple product, ask your dealer to find the answer on AppleLink. ✚

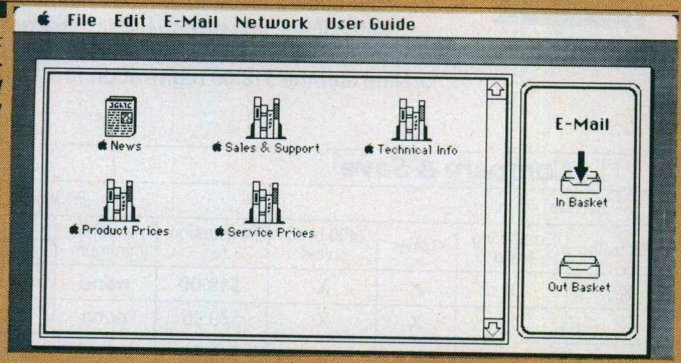

Figure 1: AppleLink contains up-to-the-minute news and sales, technical, and pricing information.

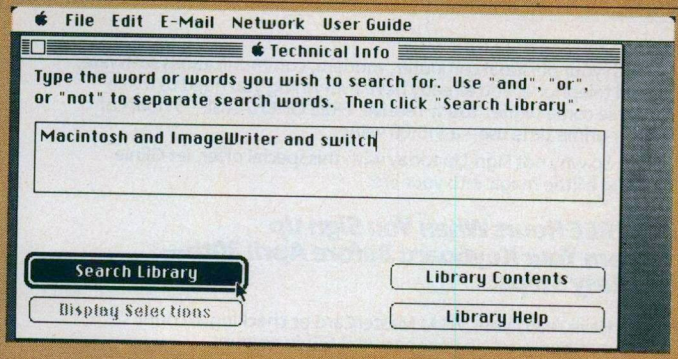

Figure 2: Dealers can access information by typing search words into the Technical Information Library.

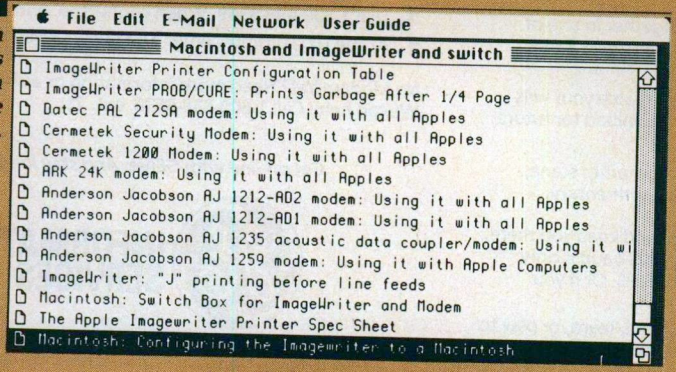

Figure 3: The system lists relevant articles containing the search words after the search is complete.

Sue Crissman is a San Francisco Bay Area writer, consultant, and contributing editor to A+. Her clients include Apple and other computer companies for which she designs and writes training, sales, and promotional materials.

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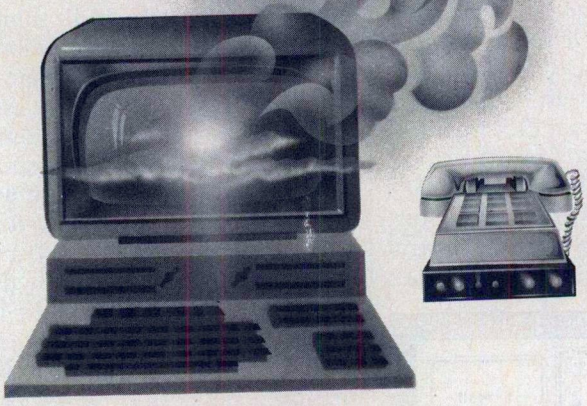

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CIRCLE 319 ON READER SERVICE CARD

A Glossary of Terms

BY STEVE ROSENTHAL

AppleWords

Neonyms, the latest batch of high-tech acronyms and abbreviations

AI

Pronounced *ay-eye*. An abbreviation for *artificial intelligence*, the study of how to make computer systems behave more as if they were bright and helpful humans. You'll see an increasing number of development tools on both the Mac and the Apple II for creating AI-based applications in the coming months, and a large proportion of new software will claim to employ AI techniques.

CD-ROM

Pronounced *see-dee-romm*. Short for *compact disc read-only memory*, a type of optical disk that uses the same basic technology as do the popular CD audio discs. Although a CD-ROM drive can only read data (the data is permanently stamped onto the disks during manufacturing), the disks are inexpensive to make and can each hold about 600 megabytes of data. Apple is one of many personal-computer companies looking into CD-ROM technology.

CLV

An abbreviation for *constant linear velocity*, a method of packing more data onto a disk by making sure the rate at which the disk passes the head stays the same on the outer tracks as on the inner tracks. In practice, that means changing the disk's rotation speed as the head moves in and out (which is why the motor on the Macintosh disk drive changes pitch as it reads).

CMOS

Pronounced *SEE-moss*. An abbreviation for *complementary metal-oxide semiconductor*, a technology for making integrated circuits that use very little power. This technology is becoming popular both for portables and for desktop computers, partly because it produces less heat than other ICs. Apple has moved to CMOS processors for its Apple II line.

DRAM

Often pronounced *DEE-ramm*. Short for *dynamic memory*, meaning a type of memory chip that keeps its contents only if supplied with regular clock pulses and a chance to periodically refresh the data internally. DRAM is far less expensive than static RAM (which needs no refreshing) and is the type the Apple II, Mac, and almost all other current personal computers use.

ESDI

So far still pronounced *ee-ess-dee-eye*. Short for *enhanced small disk interface*, an updated version of the industry-standard interface (termed ST506) that now connects most hard disks to their controllers. ESDI allows the disks to run faster and more reliably. ESDI is not a competitor to SCSI (see below), which connects to the other side of the controller.

FO

Pronounced *eff-oh*. Short for *fiber optic*, a connection that uses light pulses traveling in a transparent glass or plastic wire. Fiber-optic connections can carry large amounts of data, and they don't pick up electrical noise.

LAN

Pronounced *lann*. The acronym for *local-area network*, a connection between computers or computerized systems within a building or immediate neighborhood. AppleTalk is Apple's LAN, and both Apple IIs and Macs can also be connected to other brands of networks. Employing a LAN enables users to share files and expensive peripherals such as a LaserWriter printer.

LCS

Pronounced *ell-see-ess*. Short for *liquid-crystal shutter*, a type of optical technology based on using LCD (liquid-crystal display) panels to block or pass light through for display or reaction. LCS technology competes with laser-beam methods in the design of high-quality page printers. Proponents say that within a few years, they'll be able to produce a printer with the capabilities of a LaserWriter at a cost closer to that of an ImageWriter.

MMU

Pronounced *emm-emm-you*. Short for *memory-management unit*, a specialized coprocessor that takes care of the mapping of logical memory (as seen by programs) to physical memory (the actual memory provided on the system). That procedure lets software act as if it had more memory to work with than the system actually provides (the missing part is simulated by a hard disk) and lets multiple programs running simultaneously share memory more easily.

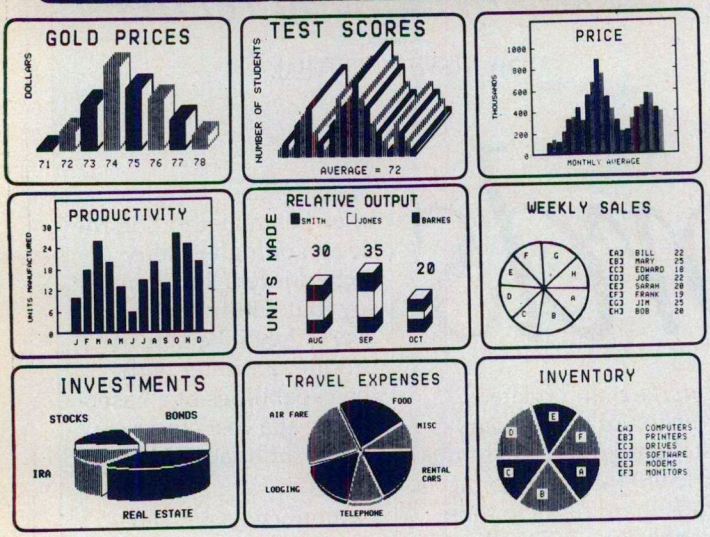
OCR

Pronounced *oh-see-are*. An abbreviation for *optical character recognition*, the process of having a computer read printed or lettered material. You can already buy a low-cost hand-held reader for your computer, and more sophisticated models are in the works.

OROM

Pronounced *oh-romm*. Short for *optical read-only memory*, meaning optical disks that have their data permanently embedded in them during manufacturing. The CD-ROM variety (see above) may be the first to become popular for personal computers.

AlphaChart!



CHARTS! Don't pay more for less! The pictures shown above are examples of charts created with **AlphaChart!**, perhaps the most powerful and friendly Apple II chart program on the market. Within seconds, keyboard-entered data can be converted into picture-perfect pie or bar charts, in 26 user-selectable styles, automatically scaled and labelled, and in color or black and white. And **AlphaChart!** prints on most dot matrix printers. If you want to customize your charts by adding extra artwork or text, or display them in a slide show, **AlphaChart!** comes with these valuable extras.....

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AppleWords

RIP

Pronounced *ripp*. Short for *raster-image processor*, the part of a printing system that translates from the input data in the form provided by the computer to the actual dots or lines sent to the marking device. A large part of what makes the LaserWriter special is its powerful RIP.

RISC

Pronounced *risk*. Short for *reduced-instruction-set computer*, a computer designed to minimize the number of different underlying operations that the central processor does in hardware in order to optimize the execution speed. Apple models generally rely on the opposite approach, using processors with powerful instruction sets. There are good arguments for either method.

SCSI

Usually pronounced *scuzzy*. Short for *small-computer-system interface*, a method of connecting peripherals such as disk drives to hosts such as computers. The Mac Plus uses a SCSI disk connection. Potentially, SCSI can also be used to hook up faster printers, optical disks, and even fast links among multiple computers.

SRAM

Pronounced *ess-ramm*. Short for *static random-access memory*, meaning memory chips that can hold data stored in them without requiring a regular clock signal. SRAM chips are more expensive and hold less data than DRAM chips (see above), but they can work faster. You might see some of them used for fast cache (temporary storage) memories.

V

Used as a prefix to indicate *virtual*, meaning capabilities that substitute for some real device or feature that isn't really there. Watch particularly this year for Vdisks (also known as RAMdisks—the emulation of disk drives in memory), VM (the emulation of memory on disks), and Vslots (the emulation of slots through interface ports).

VAR

Pronounced *varr*. The acronym for *value-added reseller*, a person or company that buys equipment at a discount from manufacturers such as Apple, combines it into systems or adds software, and then sells it to end customers.

VLSI

Pronounced *vee-ell-ess-eye*. The abbreviation for *very-large-scale integration*, integrated circuits that typically have more than 100,000 gates (active connections). VLSI methods allow a large number of circuits to be placed on each chip and keep production costs relatively low. Because such circuits require heavier initial investment and more design skills, however, using them also increases the risk involved in creating a new computer.

WORM

Pronounced *worm*. The acronym for *write once, read many times*, a type of disk drive that can record information in the field but cannot change the information that has been written. Several forthcoming optical disks will be of this type. +

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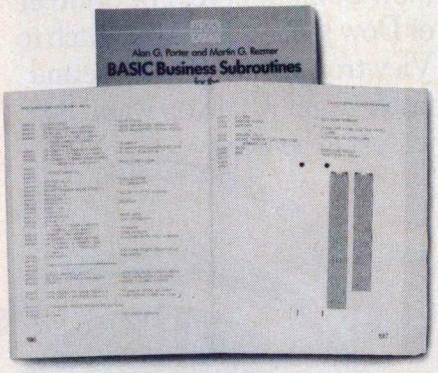

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SORTING: USING TINY BUBBLES

Today, more than ever before, computer users are interested in arranging and sorting vast amounts of information. Essential to this process is the element of speed. One of the quickest and most efficient methods used in numerous programs today is bubble sorting.

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Read the strips into your Apple and run the program. Press **CONTROL-RESET** to exit.

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Read the two strips, on the far right, into your Apple and run the program. Press **CONTROL-RESET** to exit.

These programs were reprinted from a new computer medium called UPTIME . . . The magazine on a Disk, from Viking Technologies, Inc.

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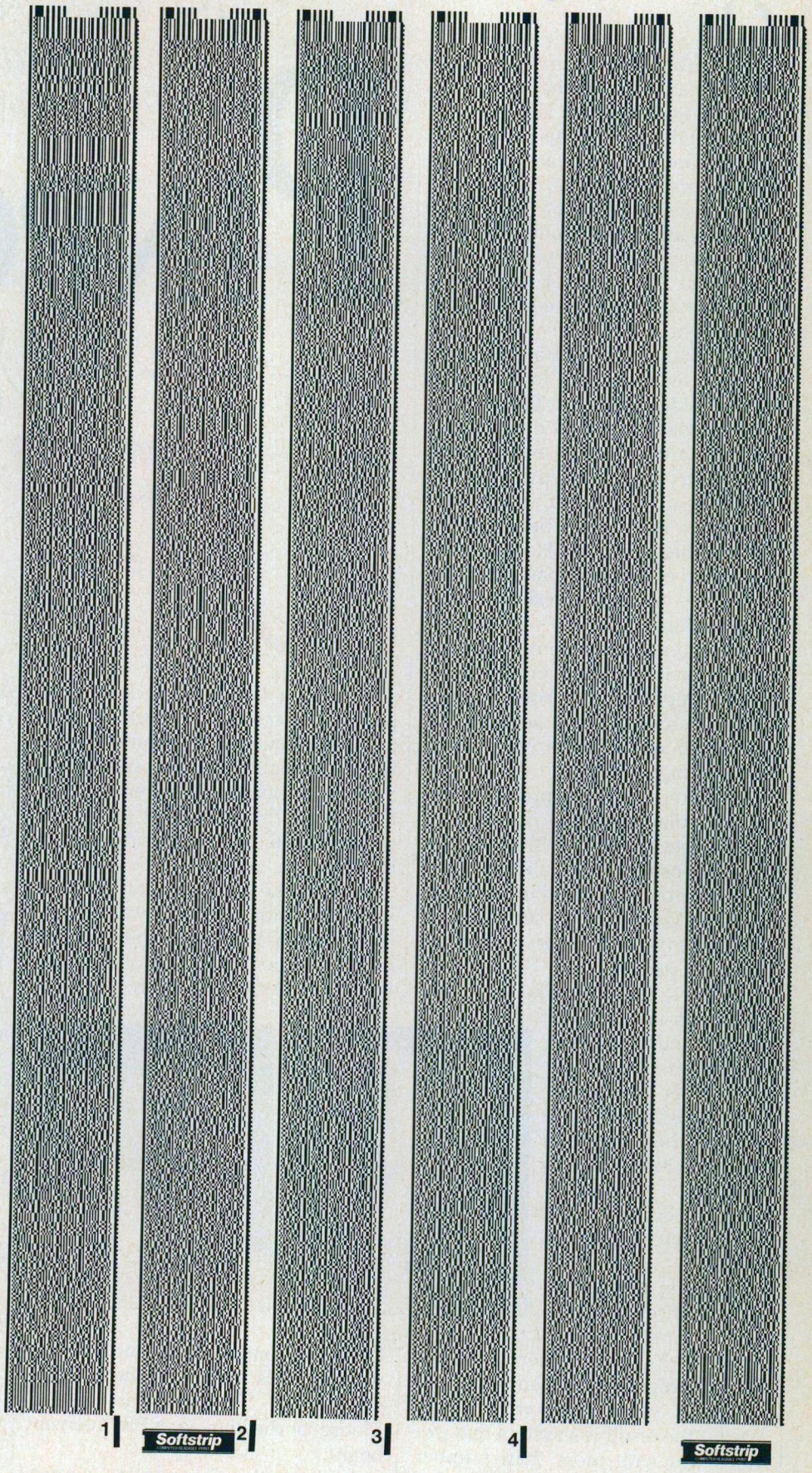


Two desktop-accessory programs for AppleWorks

PINPOINT *vs.* JEEVES

Question: What are the three great lies of the personal-computer era? Answer: The check is coming off the printer, this program is bug-free, and this software will help you be more productive.

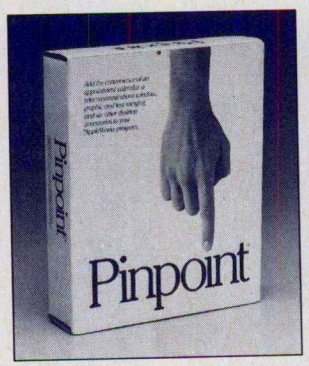
After seven years of marketing hype, you and I may both be a little cynical—especially if you've ever shelled out 250 bucks or more for a program that doesn't live up to what you thought it would be.

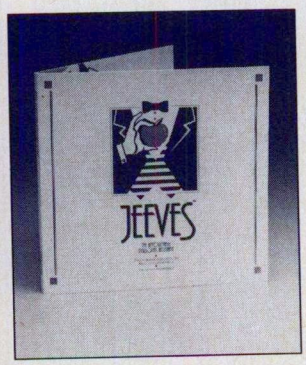
Now that we've had a chance to vent our feelings, let's look on the positive side—lately, a lot of very good software has been on the market, software that may even inspire the industry pundits to proclaim the beginning of a new era or software generation. Well, let me be one of the first pundits to do so: Hark, a new generation of software has arisen; all behold the era of the desktop-accessory programs.

Desktop-accessory programs are the personal-computer era's combination appointment book, alarm clock, conscience, and secretary. If they could make coffee, you would probably marry them.

Presently, we will compare the two most popular desktop-accessory programs, Jeeves from PBI Software, Inc., of Foster City, California and Pinpoint from Pinpoint Publishing of Oakland, California, to see if one or both have what it takes to be your electronic partner.

The best way to make this comparison is to look at Jeeves and Pinpoint separately, as though the other program didn't exist, and then consider them together to see which one is "stronger." I tested both Jeeves and Pinpoint with AppleWorks.





Jeeves is designed to add "office automation" capabilities to AppleWorks and other ProDOS-based programs. When you use Jeeves in conjunction with AppleWorks, the result is a system that provides you with more than number-crunching capability; it also helps you work. Jeeves acts as a timekeeper for you, with a software clock, a note pad, a 24-hour alarm clock, a four-function calculator, a telephone book with automatic dialing capabilities, and an appointment calendar that lasts up to the year 2000 (at which point you will donate your Apple to a museum).

Jeeves, like any other faithful servant, demands a certain work environment. In this case, the requirements are for an Apple IIc or an enhanced Apple IIe with 128K of RAM and some kind of "interrupting source." This source can be a Thunderclock, a ProClock, an AppleMouse, or the like—or a PBI interrupt board.

Without this interrupting source, the program won't work, so if you don't have one, budget one. It can cost as little as $15.

The modems with which Jeeves can communicate are any D.C. Hayes-compatible modems that are also compatible with the Apple Super Serial Interface Card. Jeeves works on either floppy-disk drives or hard-disk systems.

When Jeeves first wakes up (when you boot your machine), he asks a few questions that you must answer. If no clock is available, he queries you for the proper date and time so he can orient himself. If this is your first introduction, Jeeves will also require instructions about what printer and modem port he should use.

Once you've entered this information, you can start up AppleWorks or load another ProDOS program (Jeeves then moves into the background and waits).

If you're using Jeeves with AppleWorks, you have to remove the Jeeves diskette and type in some rather clumsy commands in order to get AppleWorks started. I would have preferred it if Jeeves had taken care of this chore.

Once AppleWorks begins, you may notice a new feature: today's date and time in the upper right hand

GREG SPALENKA

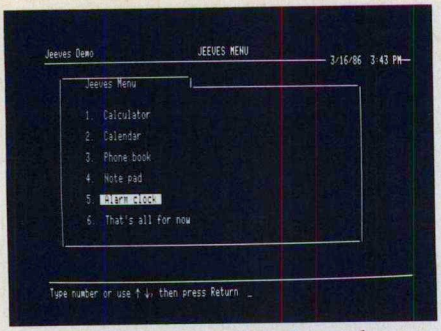


Figure 1: When you summon Jeeves, by pressing both apple keys simultaneously, you will see the menu. Notice the date and time in the upper right corner; that's your indication that Jeeves is alive and well.

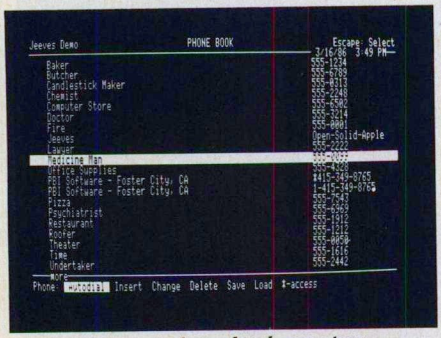


Figure 2: Jeeves' phone book can store telephone numbers of up to 17 digits and, based on your instructions, can automatically dial a long-distance access service first and use pulse or touch-tone dialing.

corner. That's your indication that Jeeves is alive and well somewhere inside your computer (see figure 1). All it takes is a simple call—the pressing of both apple keys simultaneously—to summon him almost instantly. To send him away, you press the two apple keys again.

When Jeeves appears, you see a menu that lists all the features we discussed earlier. Accessing and using them is simple. For example, to turn on the alarm clock, you select that choice from the menu, turn the alarm on, tell it when to go off, and then press ESC to go back to the Jeeves menu.

When it goes off, your Apple will buzz three times, and an apple will start blinking to the left of the date and time. To turn it off, you call Jeeves back and access the Alarm Clock menu.

Interestingly enough, Jeeves does not compete with AppleWorks for memory. On the contrary, Jeeves uses approximately 12K of memory that AppleWorks ignores within your machine. The net result is that even with Jeeves running, you have as much memory available for AppleWorks (55K) as you would without Jeeves. A pleasant Jeeves feature is that it automatically date/time-stamps AppleWorks files that you save when Jeeves is active.

When you use Jeeves in conjunction with AppleWorks, the result is a system that provides you with more than number-crunching capability; it also helps you work.

To use Jeeves to dial the telephone, you call that function via the menu. A menu bar appears on the screen with all the necessary commands, such as Auto-Dial, Insert, Change, and so on. To dial a number, you load your phone book and dial the number. Jeeves can store telephone numbers of up to 17 digits and, based on your instructions, can automatically dial a long-distance access service first, use pulse or touch-tone dialing, and send # signs (see figure 2). Next to dialing from your own memory, dialing from Jeeves' memory is the best thing.

Anybody who is on the phone should have a pen and note pad right there for taking notes, but how many do? Jeeves provides you with a simple note-pad capability that is not unlike having an electronic typewriter with one piece of paper. It's not fancy, just functional (see figure 3).

Jeeves' calculator has more than just the standard four functions (addition, multiplication, subtraction, and division). It adds the ability to fix mistakes in calculations without completely rekeying them and to modify calculations. If you really need to get fancy, Jeeves can handle up to four levels of parentheses.

The calculator has two displays. The top one shows the formula for the calculation, and the bottom one gives you the results. You can even chain various formulas or calculations together to derive an answer to a complex problem without writing the intermediate results on a sheet of paper.

The last function that Jeeves provides is an appointment book. The only difference between Jeeves' appointment book and one you can carry in your briefcase is that Jeeves is electronic (see figure 4).

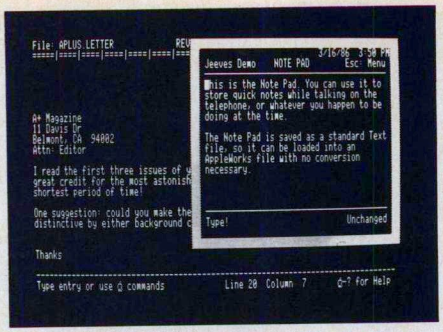


Figure 3: Using Jeeves' note pad is similar to having an electronic typewriter with one piece of paper.

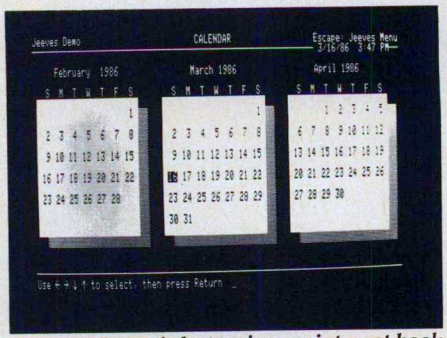


Figure 4: Jeeves' electronic appointment book is similar to an appointment book you may have on your desk. You flip through pages, make entries, and read the book the same way you would read an actual appointment book.

You flip through pages in almost the same way you would with an actual appointment book, make entries the same way, and read the book the same way. Jeeves doesn't search for appointments based on the other party, attempt to find open slots for you, print weekly summaries, or perform any of the other functions you would find in a sophisticated electronic appointment book. All Jeeves gives you is a little sizzle. Quite frankly, the chances of people converting their appointment book over to Jeeves are remote, unless of course they have a lightweight, battery-powered Apple they can take with them.

Jeeves is a good, solid assistant. It's far from the ultimate servant, but it's not a slouch either. Now for Pinpoint.

Pinpoint Precision

What does Pinpoint do? It schedules appointments, has a calculator, can send and receive information via a communications module, dials phone numbers, paints pictures in word-processing documents, has a note pad, can label envelopes and file cards, and turns your Apple into an electronic typewriter.

Pinpoint requires an Apple IIc or

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Pinpoint's ability to dial a number from any kind of program is not only handy, it's ingenious.

enhanced Apple IIe with an 80-column card; an ImageWriter, Scribe, or compatible dot-matrix printer; and a D.C. Hayes or equivalent modem. Pinpoint also works with a UniDisk 3.5 or ProFile.

When you first use Pinpoint, you have to teach it its way around your Apple. Pinpoint needs to learn things such as where your modem and printer are; line-feed, top-of-page, and control-character requirements, and whether you want to install it on your AppleWorks or ProDOS application disk. Once installed, Pinpoint loads every time you use the application without making you reboot or use strange keystrokes.

To get to Pinpoint, you press the closed-apple key and the P. Pinpoint opens a small window on your screen and displays its menu (which includes all the features I've mentioned). To select a feature, you move the cursor over the feature's name and press the Return key (see figure 5). Whenever Pinpoint needs information from you, it asks you for it with a dialog box. That's all you need to know to start Pinpoint, but what about using it?

The note pad is a baby word-processing program. It is similar to the AppleWorks word-processing program, but it can hold only a small document (32 lines long) and is not an expert formatter.

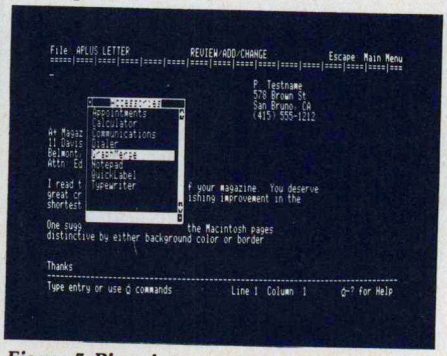

Figure 5: Pinpoint opens a small window on your screen and displays its menu when you simultaneously press the open-apple and P keys. To select a feature, you move the cursor over the feature's name and press Return.

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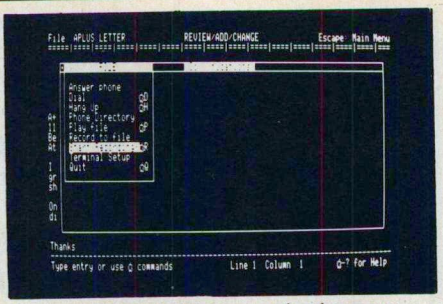

Figure 6: Pinpoint's communications are impressive for a desk accessory. You can set up macros to log on to on-line services automatically. You can send and receive data, have Pinpoint answer the phone, and have Pinpoint dial a phone number in an AppleWorks letter or database.

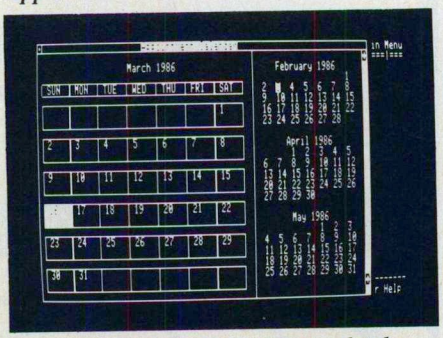

Figure 7: Pinpoint's appointment calendar puts an asterisk into the day's box if you have something scheduled on a day in the present month. To see the schedule, you put the cursor into the box and press Return.

The difference between the note pad and the typewriter option is that the typewriter allows you to type and edit only one line at a time. The typewriter is for only the briefest of notes.

You can manipulate or print notepad notes directly or through the AppleWorks word-processing program. Typewriter notes go right to the printer, but before they go, you can select the pitch, typestyles, and sizes you want.

Pinpoint's calculator looks and acts just like a four-function calculator you might buy at your local K-Mart for $1.50—no fancy math, functions, or parentheses.

To dial phone numbers, Pinpoint looks for anything on the screen that looks like a phone number, no matter whether it's in a document, your appointment book, the note pad, or in the late-payments section of an accounting program. When it finds one, it asks you if it is the right number and then dials. Many people might want Pinpoint to maintain its own phone book, but the ability to dial a number from any kind of program is not only handy, it's ingenious (see figure 6).

The appointment calendar in Pinpoint rivals not only the calendar you have on your refrigerator door, but also many of the calendar systems in big office programs. The calendar gives you a graphic view of the present month, as well as one month backward and two months forward. If you have something scheduled on a day in the present month, Pinpoint puts an asterisk into that day's box. To see what's scheduled, you simply move the cursor into the box and press Return, and a window opens up with everything scheduled in it (see figure 7). Pinpoint can also copy appointments from one day to the next. The calendar doesn't have every possible feature, nor can you ignore the fact that it binds you to your Apple computer, but with its big-picture view of four months, it's worth considering.

Pinpoint has a communications accessory that lets you automatically log on to other computers to send or receive text files.

Labels are easy to print by just selecting text on the screen. Once you select the text, you position it on an electronic envelope and then print it (see figure 8). The label information can print directly on an envelope, if it's an address, or on a gummed label.

If you're artistic and have graphs or pictures you would like to put into a document, Pinpoint has a program that lets you do it. You can move pictures into a word-processing document, crop them, pick the way you want them printed, stretch them, shrink them, place them where you want them, and then print them. The program, GraphMerge, is a snap to use and can help you add some punch to your memos and letters or even enable you to create some fancy brochures (see figure 9).

So you don't feel isolated from the rest of the electronic world, Pinpoint has a communications accessory that lets you automatically log on to other computers to send or receive text files from AppleWorks or ones that are stored in the note pad.

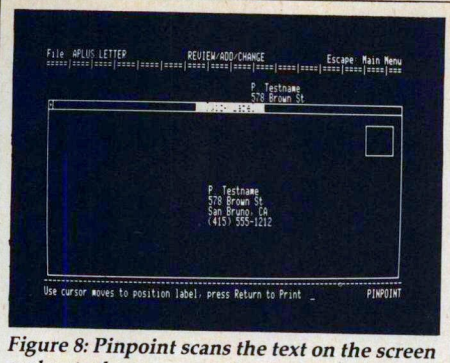

Figure 8: Pinpoint scans the text on the screen and puts the cursor on the closest thing it can find to a label. Once you've selected the text, you position it on an electronic envelope, and then print it.

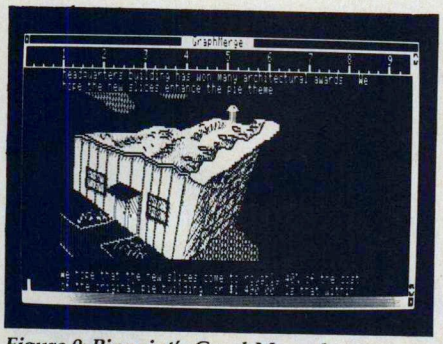

Figure 9: Pinpoint's GraphMerge lets you move pictures into a word-processing document and can help you add some punch to your memos and letters or even enable you to create some fancy brochures.

Pinpoint also has an add-on spelling-checker accessory with a 55,000-word customizable dictionary. The spelling checker corrects misspelled words in place and automatically reformats the document. Other Pinpoint supplementary products include a RAM Enhancement Kit for use with RAMdisks, a Modem Enhancement Kit, and a Printer Enhancement Kit that permits printing of graphics with Epson and Okidata printers (it replaces the GraphMerge Pinpoint Accessory).

Another interesting aspect of Pinpoint is that all of the program's modules are expandable and programmable. Each of the accessory modules uses Mac-like "resources" that allow programmers and software developers to customize or extend the features of the program. The Pinpoint programming features let you use standardized file formats and provide tools for working with I/O protocols, memory management, context-sensitive help screens, and error trapping.

In order to use the programming features of Pinpoint, you will need the Pinpoint Toolkit, which provides software-development tools such as file-handling routines, a visible-machine window that indicates CPU status, a program that permits running accessories inside other accessories, a screen-painting and construction utility, a hex calculator, and documentation on Pinpoint's internal architecture and programming conventions, along with source code for several accessories for use as tutorials. If you want to create your own accessories, you can program them with the ProDOS assembler. The developers of Pinpoint are working with Apple Computer, Kyan, and others to allow you to create accessories using BASIC and Pascal as well.

The Test of Strength

When you pit these two programs against each other on the same playing field, Jeeves is destined to lose. Consider the pricing: Jeeves costs $49.95, and Pinpoint is $69.95. Pinpoint's $20 extra price is easy to justify. You will buy a program like this only once, and for my money Pinpoint is the one to buy.

Now, I'm not beating up on Jeeves. It functions well, but the two programs were not designed to play in the same arena. Jeeves is a simple program with simple goals; Pinpoint is a more sophisticated program.

Both do what they do well, and each has a few unique features that differentiate it from the other—but when the dust clears after the long battle, Pinpoint will probably come out the winner. ✚

Ken Landis has been a consultant since 1978. He has published more than 100 articles on the use of computers as business or personal tools.

PRODUCT INFORMATION

Jeeves
PBI Software
1111 Triton, Suite 201
Foster City, CA 94404
(415) 349-8765
List Price: $49.95
Requires: Apple IIc or enhanced IIe (IIe requires interrupting source)

Pinpoint
Pinpoint Publishing
5901 Christie Avenue, #501
Emeryville, CA 94608
(415) 654-3050
List Price: $60; Pinpoint RAM Enhancement Kit, $8; Pinpoint Printer Enhancement Kit, $8; Pinpoint Modem Enhancement Kit, $8; Pinpoint Toolkit, $49
Requires: Apple IIc or enhanced IIe

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Cracking Techniques, full of tips and tricks of disk copying and cracking, which are complete sell outs at the many computer shows, are now being made available through mail order.

These highly specialized disks contain tips and techniques provided by the top crackers of the world. Anyone who has traveled the vast electronic highways of the computer bulletin boards will easily recognize these famous names: Apple Bandit, Disk Zapper, Red Rebel, Long John Silver, Axe Man, The Burglar, Captain Nibble, Mr. Xerox, Lockbuster, The Colossus, Mister C, Bozo NYC, Clone Man, Reset Vector, The Prisoner, REO Software, Parity Error, Woodpecker, The Beast, Trystan II, the Pongus, Jim Phelps, The Marauder, and the Disk Jockey. Some of these famous software pirates have been featured on ABC's NIGHTLINE, NBC's TODAY, in Newsweek, Infoworld, Tech Weekly, and in the New York Times. You can find out why all these people have earned their heavy reputations! Here now are the techniques that made them famous.

Included on the disks are full descriptions on the use and applications of DEMUFFIN and DEMUFFIN+, techniques for modifying a 16k RAM card into a fake ROM, a dissertation on special techniques, Non Maskable Interrupts, Boot Tracing, Brute Force, and several sections on handling Foreign DOS. The internationally famous Axe Man has several detailed sections on different techniques including "How to use a RAM card as a major cracking tool." Also included are the complete programming codes for building your own copies of the legendary Bozo's Cracker ROM and the Lockbuster's F8 ROM. Contains seven (7) Apple Bandit files including how to really use Copy II+ and the super COPYB and the enhanced COPYA from the Disk Jockey.

All of the information gathered together on these disks are the highlights of the 1982-85 pirating season as featured on the infamous Boston Pirate's Harbor bulletin board. Pirates Harbor has long been established as the international Mecca of software cracking. As an added bonus, complete cracking instructions are provided for many of the top pieces of software, both for games and business. These are not obscure, arcane pieces of lore; they are practical tips and techniques that you can start applying immediately the day you receive your disks.

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_____	Combo CT '83, & CT '84	79.90 65.00
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_____	CT Series All Four CT's	159.80 125.00
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CIRCLE 275 ON READER SERVICE CARD

Optical DATA STORAGE

Compact-disc technology moves into the computer arena.

The latest innovation in data storage is a home-entertainment spin-off that brings both new technology and new capabilities to the personal computer. It's the CD-ROM, or compact-disc read-only memory, which uses a laser to read data prerecorded as spots on reflective disks. The disks are just 12 centimeters (4.72 inches) in diameter, but each one can hold 540 to 600 megabytes of user data.

The CD-ROM is a variation on the compact disc that was developed for digital-audio playback and has more in common with the compact disc than it does with other computer peripherals. Like the audiodisc, a CD-ROM disk is produced by replicating a master disk. The master disk is expensive, but replicas are inexpensive, and unlike with magnetic disks, users cannot add or change data on CD-ROMs.

Their huge capacity and low replication costs make CD-ROMs ideal for electronic publishing of large databases. The most ambitious CD-ROM publication is a well-established database with a large potential market, the 21-volume *Academic American Encyclopedia* from Grolier Electronic Publishing, Inc. The CD-ROM version will list for $199, compared to $450 and up (depending on binding) for the print version. Other CD-ROM publications already out or in the works include a bibliographic database for library cataloging and references in medicine and law.

Digital Equipment Corporation was the first computer maker to offer a CD-ROM drive, with its MicroVAX II computer and VAXstation II workstation. Independent vendors first targeted IBM-compatibles and the Atari ST520, machines that have high-speed ports able to handle the fast data transfer from the CD-ROM drive.

Their huge capacity and low replication costs make CD-ROMs ideal for electronic publishing of large databases.

The Apple II is not far behind, though. Management Resources International Ltd. planned a November 1985 introduction for an expansion board based on the 68000 microprocessor that adapts the Apple II Plus or Apple IIe for CD-ROMs. The card also adds 512 kilobytes of RAM memory, provides a mouse interface, and runs Digital Research's GEM-DOS operating system. An as-yet-unnamed Management Resources subsidiary will market the card through a company called PCMA and the Apple dealer and distributor network. Packaged together with the Grolier encyclopedia and a CD-ROM drive, it will carry a list price of $1495 to $1995, depending on drive price. James E. Solomon of Management Resources expects the price to drop to the lower end of the range within six months.

CD-ROM Hardware

The basic CD-ROM drive is a box that's about the same size and shape as a full-height 5¼-inch floppy-disk drive, but it operates quite differently. The CD-ROM's read head contains a tiny semiconductor laser, packaged with optics that focus the laser's infrared beam onto the surface of a reflective disk turning at 200 to 500 revolutions per minute.

The single-sided 12cm CD-ROM disks are 1.2 millimeters thick, with a 1.5cm central hole. The data pits are pressed into the clear polycarbonate

DAVID BISHOP PHOTOGRAPHY

CD-R

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CIRCLE 187 ON READER SERVICE CARD

A CD-ROM system linked to an Apple II can provide up to 600 megabytes of storage per disk. (Optical disk courtesy of Philips Subsystems and Peripherals, Inc.)

plastic that makes up most of the disk, forming a continuous spiral, with successive turns just 1.6 micrometers (about 0.00006 inch) apart. Those close lines scatter light, giving the disk a rainbowlike appearance. The pits are invisible to the unaided eye, about a micrometer across and just 0.11 micrometer deep. One inch of the spiral holds 42,000 bits; the entire disk holds 4.3 to 4.8 gigabits of user data—540 to 600 megabytes—depending on data formatting, which differs somewhat among manufacturers. The physical arrangement of data on the disks is specified in the licensing agreements, which manufacturers must sign with Sony and N.V. Philips, the companies that jointly developed and patented compact disc technology.

The read beam reaches the pits through the plastic substrate, which focuses it down to about one micrometer in diameter. A reflective aluminum layer helps the flat regions reflect nearly 100% of the laser beam; the pits reflect only about 30%—a protective layer covers the aluminum to keep reflectivity high. A photosensor in the read head decodes the data by detecting the variations in the reflected light. Replication and reading can generate more errors than with magnetic media, but sophisticated correction codes are able to reduce read errors to no more than one in 10^{12} bits.

High data density is not the only advantage of the CD-ROM. Data is stored beneath the surface of a CD-ROM, so wiping off a greasy fingerprint won't take the data with it—as it can on a floppy disk. Magnetic fields, which can scramble data on a magnetic disk, do not affect CD-ROMs, and the readout head does not have to come as close to the disk as it does with magnetic media.

The advantages of CD-ROMs for data storage are similar to those of compact discs for audio—and those advantages have made CD players the rage on the consumer-audio market. Because CD-ROM drives use many of the same optical and mechanical components as audiodisc players do, computer users will benefit from the economies of mass production for the audio market.

The Videodisc Connection

The newfound success of the compact disc is ironic because the CD is an offspring of the much-less-successful home videodisc player. The Dutch electronics giant N.V. Philips achieved a technical triumph in developing 12-inch (30-centimeter) optical videodiscs for home entertainment, but consumers preferred videocassette recorders, which can record as well as play back programs. Although 12-inch videodiscs remain on the home-video market, their major uses are in institutional training and presentation.

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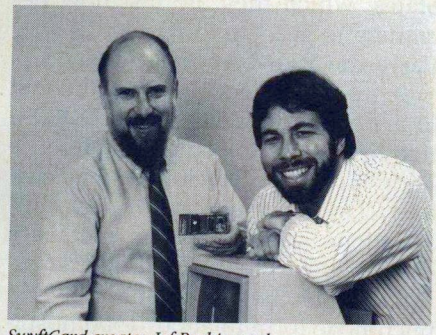
You've never seen an Apple IIe do word processing, filing, communicating and calculating the way it does with a SwyftCard.

Steve Wozniak calls it revolutionary, adding "If I had thought of the SwyftCard while creating the Apple II, I would have built it in." Fomenting revolutions comes naturally to SwyftCard inventor Jef Raskin, whose previous efforts to make computers simple and useful include creating the Macintosh™ project at Apple.



SuyftCard creator Jef Raskin and Apple II creator Steve Wozniak

SwyftCard transforms the Apple IIe into the computer it ought to be.

The SwyftCard creates a 40K-byte working space, or "universe," capable of holding about 20 pages of single-spaced text. The universe accepts whatever you put in — text, numbers and data, in any form you choose, without you having to switch programs or modes.

Throughout your workday, you can enter information into the universe in free form: a report, names and addresses, daily to-do list, new telephone numbers, client list — anything you're working on.

A universe resides in memory while you are using it, and when you are done you save it to a disk. An unlimited number of universes can be created, each kept on a separate disk.

The secret to working in a SwyftCard universe is the patent-pending cursor. It works faster than control keys or a mouse, and doesn't make you take your hands off the keyboard.

SwyftCard is a better solution to your day in, day out word processing and data management needs. It is faster, easier and more useful.

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From a power-off start, SwyftCard loads a universe and displays exactly where you were last working in just six seconds, automatically, with no commands.

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Apple IIe, regular or extended 80-column card, 80-column monitor, one disk drive with controller. For communications: 300 or 1200 baud modems and Super Serial card. To transfer data between SwyftCard and Apple programs with ProDos utility: extended 80-column card or two drives. To print: any Apple, Brother, C.Itoh, Centronics, Epson, HP, NEC, Okidata, Panasonic, Qume, Star, Toshiba and most other printers.

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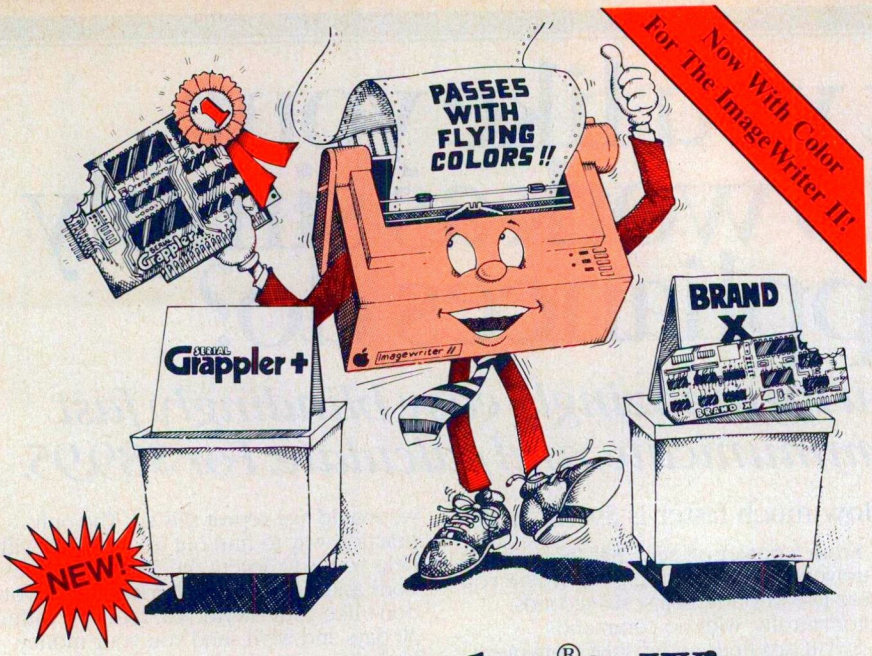
CIRCLE 165 ON READER SERVICE CARD



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CIRCLE 253 ON READER SERVICE CARD

Some companies use 12-inch videodiscs in CD-ROM-like systems for retrieving prerecorded data. Manufacturers including LaserData, TMS, Inc., and Reference Technology see some advantages in videodisc-based systems, including both analog and digital capabilities and a larger storage capacity. Reference Technology can put one gigabyte of data on each side of a 12-inch disk—a two-gigabyte total capacity that is more than triple that of a CD-ROM. The catch is price. Single Reference Technology videodisc drives list for $15,900—more than ten times the company's $1535 list for CD-ROM drives. Both mastering and replication of videodiscs cost about 75% more than for CD-ROMs. Most companies seem to believe that for large-scale markets such as the personal-computer market, the economies of scale of the CD-ROM will carry the day, particularly once disk-replication plants begin full-scale operation in the United States, which they are just now beginning to gear up to do.

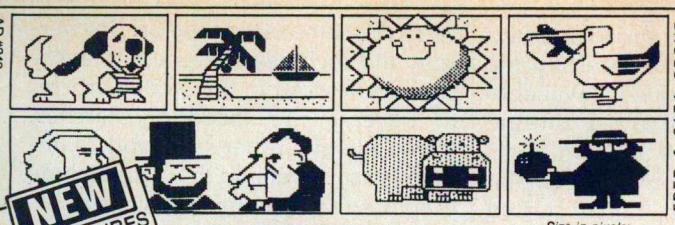
Early CD-ROM Applications

Although videodiscs were the first to arrive on the scene, the CD-ROM tide has begun to come in. Reference Technology has developed some custom CD-ROM systems for special applications, such as a database covering toxicology and drug interactions, which the publisher had sold in microfiche form to about 1500 hospitals and medical organizations. Users can extract information on a substance from the CD-ROM version simply by entering its name into the host computer, a time-saving feature that can be critical in treating poison victims.

Another specialized CD-ROM system is the BiblioFile system from The Library Corporation. Two CD-ROMs contain cataloging information on more than 1.4 million books, with updates distributed regularly to subscribers. Its users are librarians who enter data such as book titles and author names through an IBM-compatible personal computer to search for the cataloging information, which can be stored on disk or printed out. The price is steep: $2930 for the CD-ROM drive and software, plus added subscription fees of $870 to $1970, depending on the services you choose. Library users can save telecommunications and database time charges, however.

Grolier's encyclopedia is the first

AD #242



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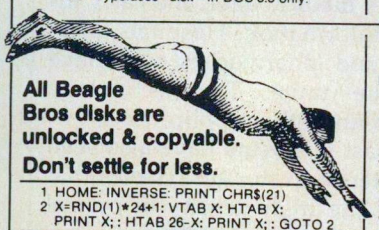

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```
1 HOME: INVERSE: PRINT CHR$(21)
2 X=RND(1)*24+1: VTAB X: HTAB X:
  PRINT X;: HTAB 26-X: PRINT X;: GOTO 2
```

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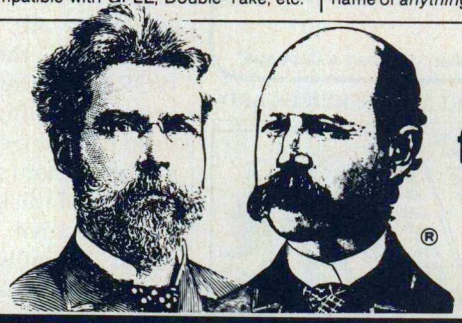

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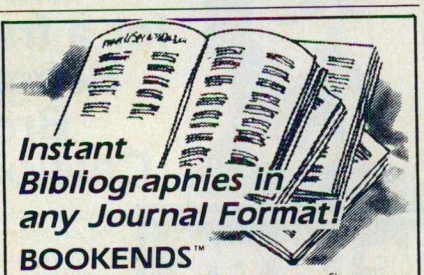

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CD-ROM aimed at a broad market. The data comes from the electronic version of the encyclopedia available on CompuServe and other on-line services; the software is from Activenture, Inc., the company Digital Research founder Gary Kildall started after he left Digital Research. The search routines are more powerful than ordinary word searches. Besides finding every use of a word such as *Constantinople*, they identify the type of reference.

They also have an alternative Browsing mode, which lets users pick the "C volume" of the encyclopedia, for instance, from a "shelf" on display and then leaf through the "pages" from COA to COP or, alternatively, just pick out the article on Constantinople. The initial CD-ROM version uses only a fifth of a disk to carry the same text as the on-line version and includes references to every significant word in the 30,000 articles to increase the speed of searches. John Cole of Grolier says work is under way on a version that will include graphics from the printed version.

Schools and libraries are interested in the CD-ROM encyclopedia, but most of them have Apple IIs. That fact, and the realization that some five million Apple IIs have been sold, helped stimulate Management Resources to build its CD-ROM add-on board for Apples (the product is being marketed by MicroTRENDS, Inc.). A package for the Apple II Plus and IIe made its debut at the end of October at the Federal Office Automation Show in Washington, under the auspices of Falcon Microsystems, which markets Apple equipment to the fed-

OTHER OPTICAL DATA STORAGE

Optical data storage can take several forms besides CD-ROMs. Two present types are suitable for personal computers: the 13 cm (5¼-inch) WORM (Write Once, Read Many times) disk and the optical card. A third type, the erasable optical disk, is a more distant possibility.

WORM disks are coated with a light-sensitive material. Focusing about 20 milliwatts of power in a write laser beam onto the material creates a data spot, analogous to the pits prerecorded on CD-ROMs. The WORM disk, which is 13 cm in diameter, is an unofficial standard for personal-computer systems and can hold 100 megabytes or more of data. The choice of the 13 cm diameter to match magnetic floppy disks makes WORM disks just a centimeter larger than CD-ROMs, but the two formats would be incompatible anyway, because CD-ROMs store data more densely.

The WORM drive might take the place of a hard disk or provide high-capacity archival storage now unavailable to personal computers. A few companies in the United States and Japan have announced commercial models using 13cm disks for personal computers, but these products have yet to reach users.

The Drexler Technology Corporation has a different approach: embedding a strip of light-sensitive material in a plastic card the same size as a credit card. You can prerecord data or add it later. Its data pits are much larger than those on disks, and the cards can hold only about two megabytes, but that amount is still equivalent to about 800 printed pages. This lower density eases tolerances and cuts costs. Blue Cross/Blue Shield of Maryland uses this technology for the medical-record LifeCards it plans to distribute to its subscribers. The card will identify conditions requiring special attention and drugs prescribed, give other medical data, and carry insurance information. Hospitals, physicians, and pharmacists' will have read/write units. The technology may also find other applications.

The past few years have also seen much interest in storage systems that combine the high density of optical storage with the erasability of magnetic media. The leading approach now is "magneto-optical," which relies on light-induced changes in magnetic properties of a material. These properties affect the way it transmits light, allowing data to be read out with a low-power laser. Although promising progress has been made and Kodak's Verbatim subsidiary has announced product plans, significant technological hurdles remain to be surmounted before magneto-optical disks put magnetic storage into the museum.

eral government, and at the January COMDEX computer show, the company demonstrated an improved version of the same product.

The Apple II add-on board, including a cable socket, mouse adapter, and compatibility with GEM-DOS and Atari software, will list for $795. A complete package, including circuit card, connector cable, and the CD-ROM drive and disk, is expected to list in the $1495–$1995 range, depending on the final price of the disk drive. Solomon says the add-on does not require an extra power supply or an external fan.

More Applications Likely

Developers preparing the Grolier encyclopedia have opened up an easy path for further CD-ROM products. Some software is specific to the encyclopedia or to a particular computer, but much can be adapted for other CD-ROM applications. Activenture has designed its Knowledge Retrieval System to facilitate data retrieval from any CD-ROM database and also plans to prepare databases for the CD-ROM format and to develop user interfaces for specific databases.

No one else has announced a CD-ROM encyclopedia, but other CD-ROM projects are not in short supply. They include legal and medical texts whose professional users will be willing to pay a premium for fast and easy access to data. An Activenture spokesman says that such professional users and libraries are likely to buy CD-ROM databases before general consumers are. Publishers do not seem worried about making printed versions obsolete—indeed, John Cole of Grolier says that sales of the *Academic American Encyclopedia* have risen since a version went on-line, and he expects that the same may happen with the CD-ROM version.

CD-ROM projects, including legal and medical texts, are not in short supply.

More plans are clearly in the works. Mention CD-ROM systems, and some publishers of professional and reference material get excited and swear you to silence before their enthusiasm bubbles over. CD-ROM developers regard their format as a logical one for large and multivolume references that require updating no more than about once a month, particularly where ease of use will add greatly to the value. Someday, we may see CD-ROM areas in libraries.

Good news may be in the offing on the price front, too. Atari has built its new ST520 with a direct-memory-access channel to accommodate CD-ROMs. The company hopes to begin selling CD-ROM drives early next year at a target retail price of $600. Atari is waiting for production volumes to reach high enough levels to allow such low prices, but when they reach those levels, other CD-ROM drive prices should come down as well. The bad news for Macintosh owners is that no one I contacted would admit to knowing anyone working on a CD-ROM adapter for the Mac. ✚

Jeff Hecht is a free-lance science/technology writer based in Newton, Massachusetts. His books include Laser Supertool of the 1980's *and* Beam Weapons: The Next Arms Race.

WHO MAKES CD-ROM DRIVES?

Most CD-ROM drives are manufactured by Japanese industrial giants that also produce compact disc players, including Sony Corporation, Denon, Hitachi, and Matsushita/Panasonic. These companies may not retail CD-ROM drives in the United States. They are more likely to sell their drives in bulk to American firms that will then offer them as computer add-ons or as parts of complete systems.

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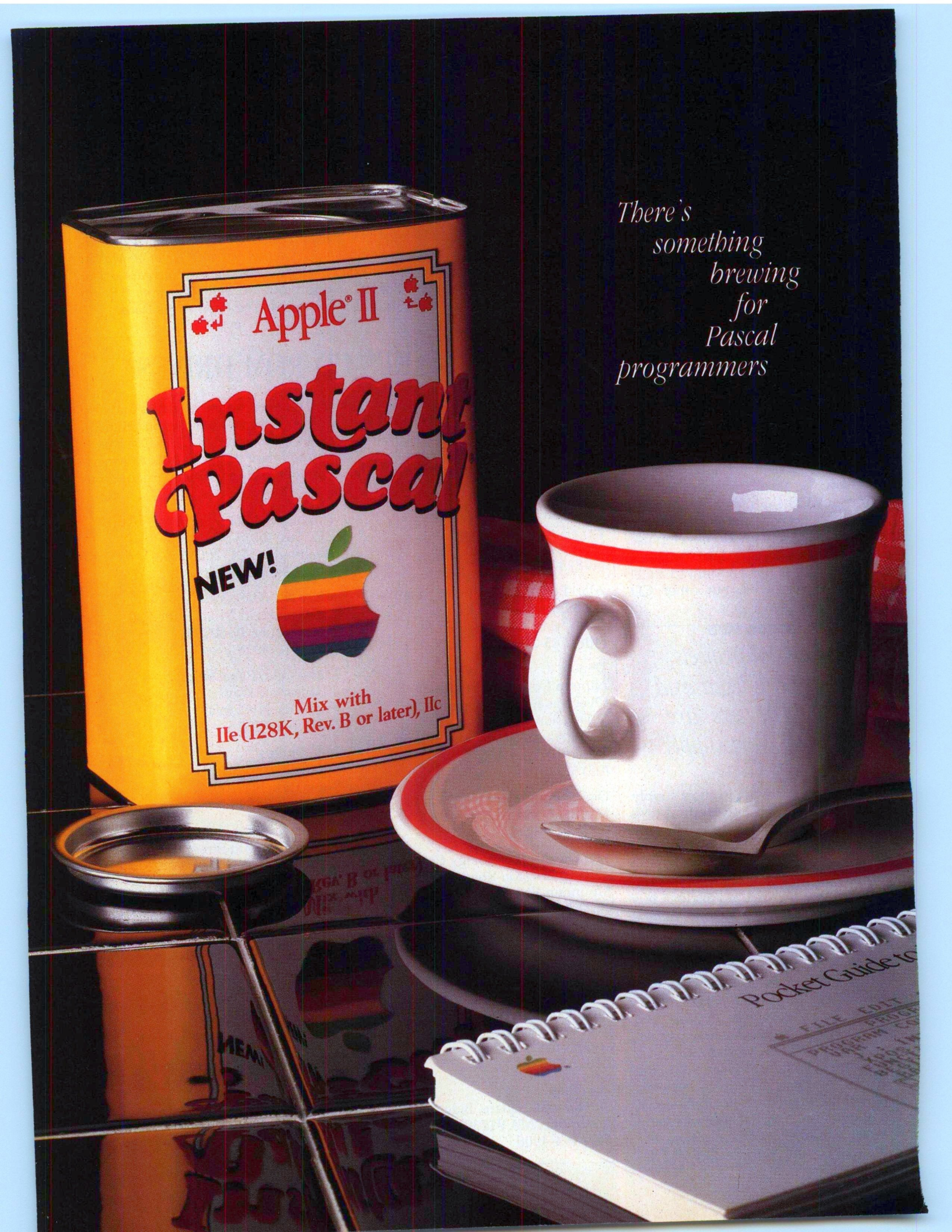
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INSTANT PASCAL

Think Technologies' latest creation lets Apple II programmers leap over Pascal's language barriers.

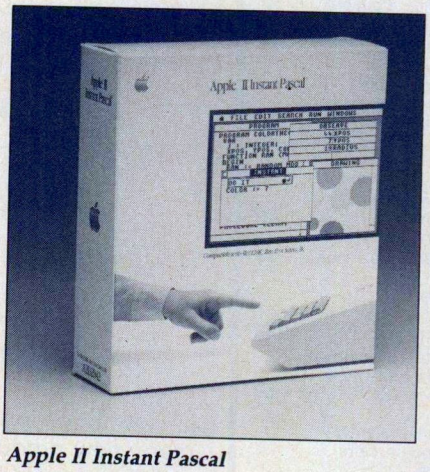
If you write computer programs, you've probably developed a personal style of programming. If you started with BASIC and didn't have any outside guidance, you probably think of programs as collections of statements in which the first line contains the first instruction, the second line contains the second instruction, and so on.

This programming style causes problems when the program gets longer than 20 lines or so. At this point, you may have a hard time keeping track of what has already happened and what needs to happen next.

In response to the need of programmers to keep track of what's going on in a program, designers have created languages such as Pascal that impose an outline structure on the programming process. Just as outlines help writers organize their thoughts, structured languages help programmers to organize their programs.

The most popular style that you hear about these days is called "top down" programming, which breaks your tasks down into a series of subtasks and represents each of these subtasks as a procedure or function that is a miniprogram in itself. You can break large procedures, in turn, into collections of smaller procedures, with the goal of making programs that are easy to read and easy to fix when something goes wrong.

Top-down programming works the best with languages that allow the users to create personal libraries of procedures, that allow information to pass freely between procedures, and that let the procedures work with variables whose names and values are private (or "local") to the procedure itself. Pascal is one language that provides tools for top-down programming, and LISP, Logo, and some versions of Forth provide these tools as well.



Apple II Instant Pascal

Structure and Bondage

What makes Pascal different from some of the other programming languages is that Pascal programmers have to follow a rigid structure, regardless of the size of the program.

At a certain point, the structure that languages such as Pascal facilitate can become a straitjacket, preventing (or at least discouraging) you from experimenting. For example, suppose you want to do a quick calculation while you are at the keyboard. With most versions of Pascal, you have to write a small program, such as

```
PROGRAM calc;
BEGIN
 writeln (6 * 6)
END.
```

Once you've written this program, it needs to be compiled and executed. After all these steps, the number 36 finally makes its appearance on your computer screen.

You deserve better than this. The structure of a traditional Pascal program makes it cumbersome for the experimenting that all of us (structured-program fanatics included) like to do from time to time.

One of the reasons I waited a long time to learn Pascal was that the labor of working with cumbersome editors and compilers, coupled with Pascal's rigid structure, contrasted sharply with my desire for a programming language that let me tinker with my program and see my results immediately.

I wanted to have two programming environments: an interpreter that let me tinker with my code and

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see the results in a hurry and a compiler that let me take my debugged code and turn it into an efficient program. Traditional Pascal compilers meet the second need but are not acceptable tools for program creation.

Another Way

When Think Technologies created Macintosh Pascal, it made this language suitable for those of us who wanted to explore Pascal with the same flexibility and freedom we enjoyed with languages such as Logo or Forth. This Macintosh Pascal interpreter removed all my reasons for avoiding Pascal in the past.

Early last year, I had a chance to see the latest creation from this company, a Pascal interpreter for the Apple IIc or IIe with 128K of RAM that (to my amazement) so resembled the Macintosh version that programs created on one machine could work on the other.

Yes, the Apple II version (sold by Apple as Instant Pascal for the IIc or IIe, revision B or later, with 128K of RAM) has windows and menus and can work with a mouse. (To use a mouse on the IIe, you must have an AppleMouse interface card; the IIc has this interface built in.)

The Instant window solves all the problems I have had in learning how to program in Pascal.

You have probably noticed that many new products for the Apple IIe and IIc are making increasing use of a Macintosh-like interface. Instant Pascal is no exception to this trend. Although you don't have to have a mouse to use this language, controlling the pointer with the keyboard requires skills similar to those you need to play a Chopin etude.

Getting the Picture

The graphic capabilities of Instant Pascal are similar to those of the Macintosh version, even to the extent of replicating some of the QuickDraw routines. For example, Instant Pascal provides a graphics window on which you can draw pictures made from lines, ovals, circles, and rectangles. The graphics pen has four characteristics: location, size, pattern, and mode. You can set the pen size to

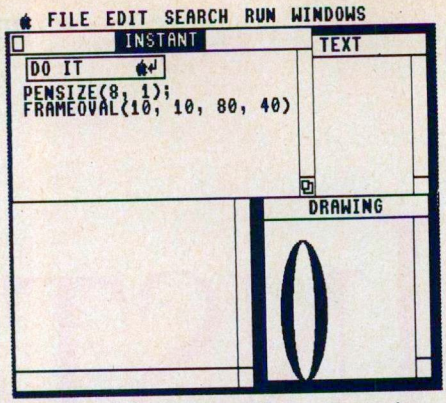

Figure 1: The execution of a few lines of Pascal in the Instant window

have any width and height (measured in dots). The pen pattern in Instant Pascal even includes a feature not found in the Macintosh version: color! The Mode setting determines the effect you'll get when you draw a pen pattern on top of a pattern that is already on the screen.

Because of the excellent graphics capabilities of this language, you can learn Pascal programming through graphics. Shades of Logo!

An Able Interpreter

Although Instant Pascal lets you create pretty graphics and provides a replica of the Macintosh ambience, neither of these aspects is as important to me as the tools the interpreter provides.

I often want to try out a function or a procedure before including it in a program. The designers of Instant Pascal made that task easy with a special window called Instant.

Suppose you want to see what an oval would look like if you drew it with a pen point made from an eight-dot-wide horizontal line. All you need to do is enter the following lines in the Instant window and give the Do It command (see figure 1):

```
pensize (8, 1);
frameoval ( 10, 10, 80, 40)
```

One complaint: In the Pensize procedure, the two numbers represent the horizontal and vertical measurements respectively. In the frameoval and other objects you create with four coordinates, the sequence of numbers is top, left, bottom, right, which is inconsistent with the ordering of numbers for setting the pen size or for drawing lines!

Once you've tested program fragments in the Instant window, you can copy and paste them into a "real" Pascal program that you're creating in the Program window. From my per-

spective, the Instant window solves all the problems I have had in learning how to program in Pascal.

In addition to this feature, Instant Pascal also provides a fairly intelligent error detector. It catches some errors, such as missing commas in an argument field, when you're typing a program and others when you run the program. Rather than flag all syntax errors with the same message (such as BASIC's ubiquitous SYNTAX ERROR), Instant Pascal provides help in locating bugs (see figure 2).

Of course, not all bugs are syntactic. To help you locate other types of errors in your program, Instant Pascal provides an Observe window that

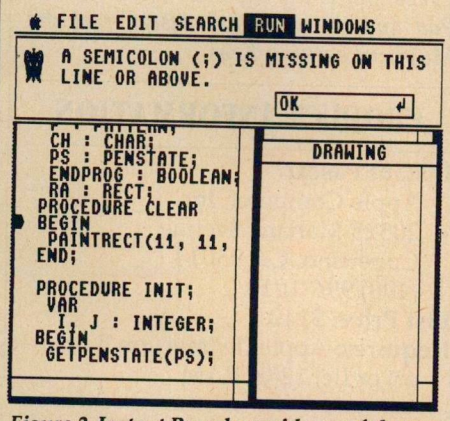

Figure 2: Instant Pascal provides useful error messages that help users, rather than embarrass them.

displays the values of up to four variables or expressions as they change during the execution of a program.

The inclusion of features such as this one is evidence that the designers of Instant Pascal placed the need of Pascal programmers for advanced programming tools above ease of use.

Documentation

Ever since the original Apple Presents Apple disk came out, I have grown accustomed to spending about an hour in front of the computer with each new Apple program, letting a special program tell me what my latest piece of Apple software is going to do for me. Instant Pascal is no exception. The disk Apple Presents Apple II Instant Pascal contains ten lessons (complete with tests and "pop quizzes") that explain the windows, menus, cursor control, and editing features of the product. Thus, I didn't even open the regular documentation until I had played with Instant Pascal for an entire day.

Along with the disk (which does not attempt to teach Pascal, by the way), Apple provides a 140-page pocket guide for Instant Pascal and an excellent introductory book, *Apple II Instant Pascal—an Introduction to Programming* by Robert Moll and Rachel Folsom. This book is supplemented by a disk full of sample programs that are discussed in the text and contains exercises that provide lots of practice in creating programs.

From an introduction that focuses on graphics, the book moves on to cover many other interesting topics, including a program that lets you see if a given sentence is a palindrome.

One of my favorite applications in this book counts the frequency of selected words in a document. As the book points out, this type of program helped settle the question of who authored some of the Federalist Papers. The sample disk contains text files with documents by Madison and Hamilton, along with a file whose authorship is "unknown." Using the word-frequency program, you can find out who the real author was!

This book is a refreshing departure from introductory programming texts

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that do little more than rehash the reference manual. It is the perfect complement to a nicely done product.

Is Instant Pascal for You?

For better or worse, Pascal has been selected as the language for the Advanced Placement test in computer science. Ever since this decision was made, high schools all over the country have rushed to offer Pascal courses. As a result, former swimming coaches and other such computer experts are now trying to teach structured programming to pubescent programmers.

The ease with which Instant Pascal lets you test program segments before incorporating them into larger programs makes it perfect for those who are just learning how to program. You feel as though you had a helpful teacher at your side.

The school market may help ensure that Apple and Think Technologies recover their investment in this product (see Steve Rosenthal's "Thoughtware" column in this issue), but I think Instant Pascal will be an important first step for many of us self-taught programmers. Although Instant Pascal doesn't work directly with a compiler (yet!), many programs created in this language can easily be translated to run with Turbo Pascal or with other available Pascal compilers.

We might see programs written on one Apple computer automatically becoming products on the other.

It's funny, but for years I avoided Pascal like the plague. I was embarrassed to find that my complaint was less with the language itself than it was with the tools it gave me for creating programs.

I wonder what would happen if the people at Think Technologies applied their expertise to other languages. Perhaps we would become a nation of programmers after all.

One of the first Instant Pascal programs I looked at was one that let you transfer programs from Instant Pascal to Macintosh Pascal and back again. Given the large number of Apple IIe and IIc owners who have access to Macintoshes, this program is a welcome gift. Since rumor has it that Apple will be releasing a version of Macintosh Pascal that allows the creation of commercial applications, we might see programs written on one Apple computer automatically becoming products on the other. Those of us who are involved with commercial software development would love nothing better than a tool that let us develop for two machines at once! ✚

Dr. David Thornburg is the author of numerous books and articles on computing and is a regular contributor to this magazine. He has been interested in educational computing since the late 1970s and is the inventor of the Koala-Pad and the principal designer of the Muppet Learning Keys.

PRODUCT INFORMATION

Instant Pascal
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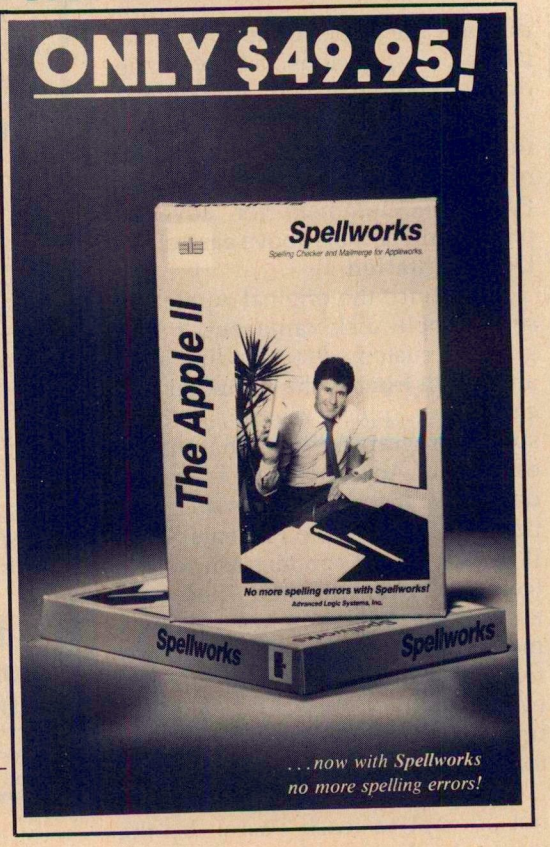

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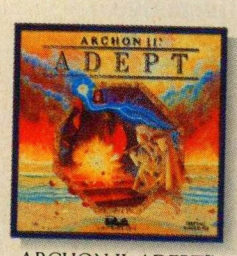

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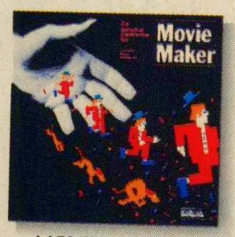

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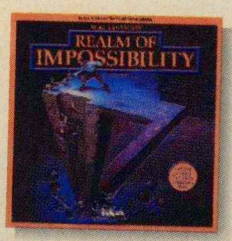

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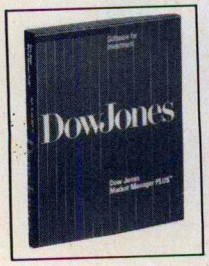

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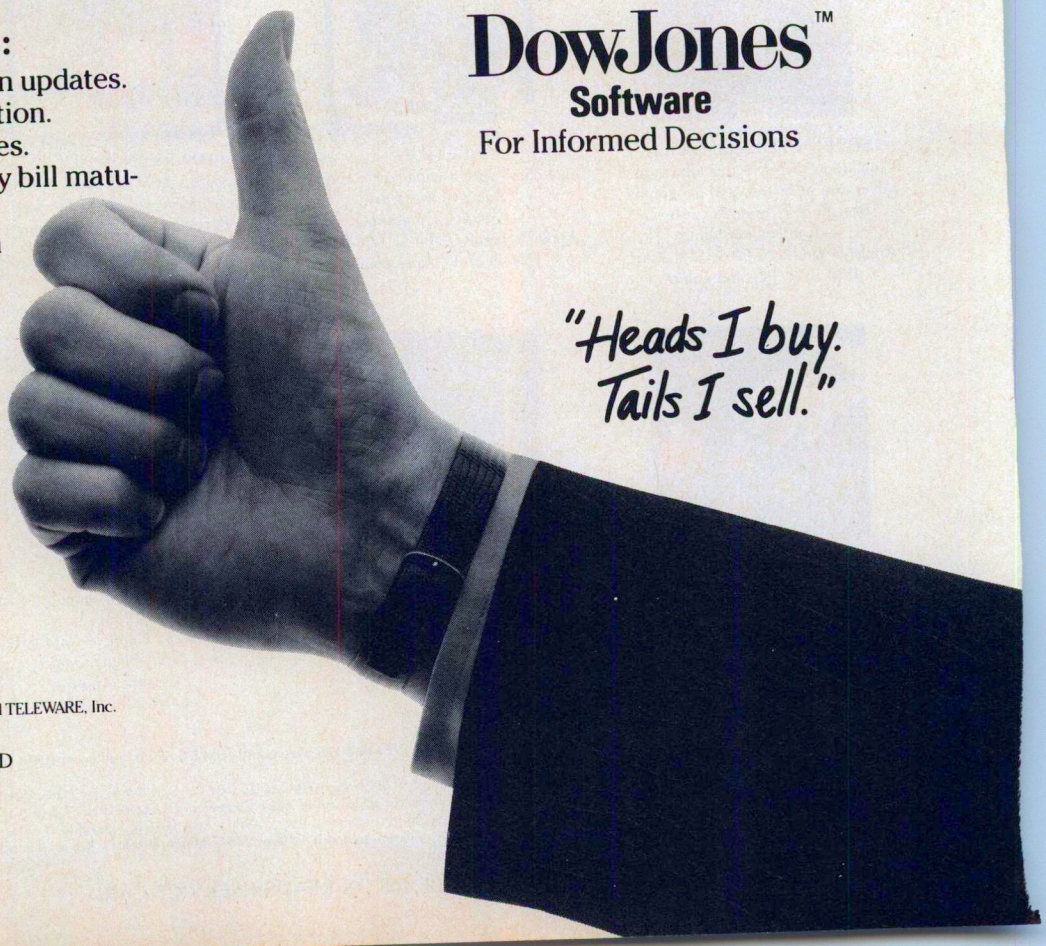

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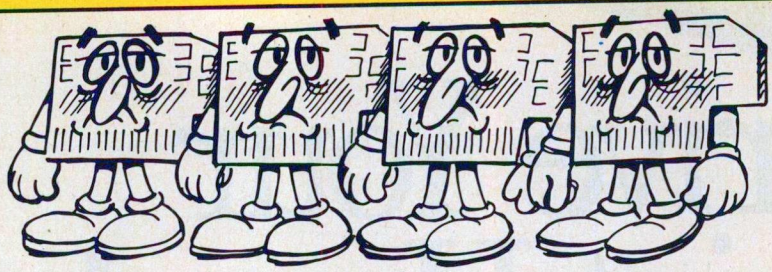

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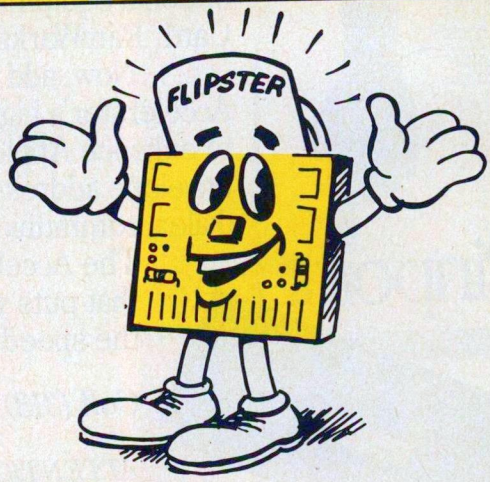

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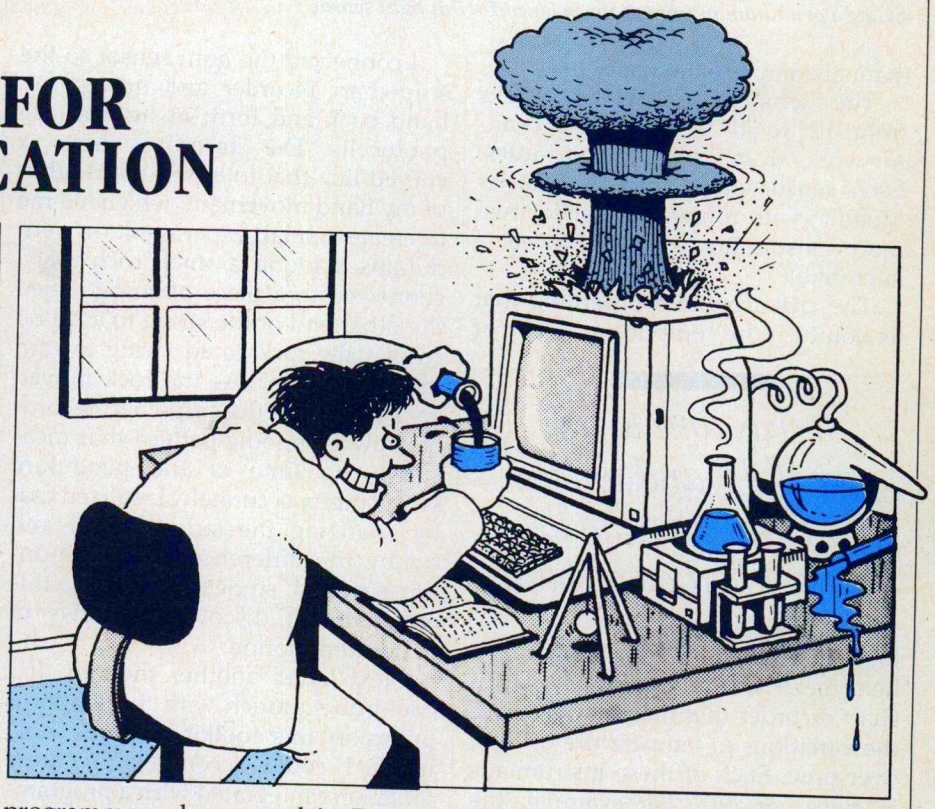
CIRCLE 230 ON READER SERVICE CARD

BY DAVID D. THORNBURG

A SYMBIOSIS FOR SCIENCE EDUCATION

Brøderbund's Science Toolkit and Logo complement each other.



The mention of computers in science education usually conjures up images of simulation programs such as Scholastic's Operation Frog or one that simulates titrations so students won't risk spilling acid on a textbook.

Simulations fall into three classes: those that model events that take too long to experience in the real world, those that are too expensive or too dangerous to perform, and those that model events from history or from the imagination.

You can find examples of all three types of simulations in classrooms ranging from the early elementary grades through college. For example, a student interested in exploring the intersection of two galaxies will not be able to conduct observations over the many millions of years such an intersection would take, so a computer simulation that shows how this process might appear when compressed into a few minutes is quite valuable.

In the area of dangerous events, several simulations are available of runaway nuclear reactors that must be brought under control. Using these programs is certainly safer than working with the real thing.

One of the most widely used historical simulations is Oregon Trail (from MECC), which allows a student to play the role of someone moving west in the 1800s.

The Limit of Simulations

The problem with simulations is that, at best, they provide only a model of the real experience. The user of a simulation is at the mercy of the programmer who created it. For example, if the programmer of a simulation on Newtonian physics decided that the attractive force between objects varied as the cube (rather than as the square) of their distance from each other, a student who worked with this simulation might develop an incorrect view of how gravitational attraction actually works.

The problem with simulations is that, at best, they provide only a model of the real experience.

Even the best-intentioned designer of a simulation has to make trade-offs in the accuracy of event modeling—even the most simple process has too many interrelated events to allow a simulation program completely to take the place of direct observation.

If students are using computers to simulate scientific experiments, they can also employ them as a tool for direct experimentation.

In the past few years, several companies have introduced products that make the personal computer a tool for scientific experimentation. One of the recent entries in this market is the Science Toolkit from Brøderbund.

Rather than restrict users to second-hand experiences, the Science Toolkit provides both the tools and the guidance to let students perform physics experiments on their own. The Master Module that comes with the product consists of a connector box that plugs into the game port of an Apple IIe or IIc. (Apple II Plus owners need to get a converter plug to let the module connect to the 16-pin game port inside the computer.)

The module is shipped with two sensors: one for temperature and the other for light. A disk containing several "instruments" and an extensive

CHRIS REED

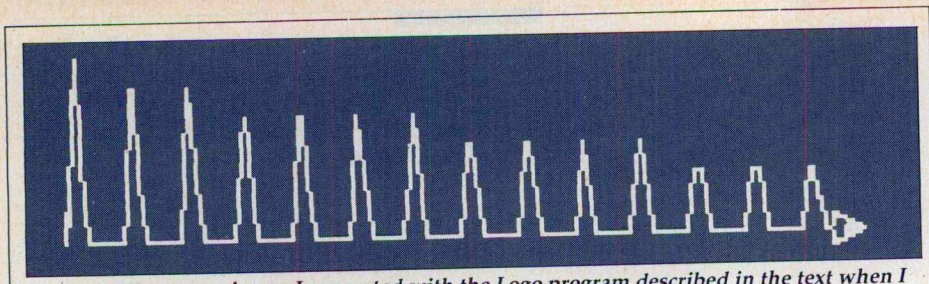


Figure 1: The screen image I generated with the Logo program described in the text when I swung a pendulum in front of the Science Toolkit light sensor

manual complete the package.

The temperature sensor works from -12° to 60° C, and the light sensor works from 0 to 500 footcandles. Each sensor plugs into the Master Module, with room left over for two more sensors (to be announced at a later date).

The disk contains programs that let you turn the computer into any of four instruments: a thermometer, a light meter, a stopwatch, and a strip-chart recorder that makes a record of the variations in temperature or light over time. Each of these instruments is quite versatile. For example, the strip-chart recorder allows the creation of a graph containing 4000 points measured over 5 minutes and provides additional time settings that range up to 24 hours for longer experiments. You can save the output of the strip-chart recorder on disk for later reference and can print it out as a table of numbers.

It was time to ask 'what if?' and to play with science with the spirit I had as a child.

In addition to providing the basic tools of scientific measurement, this product contains a manual that explains the use of each tool, provides detailed instructions for experiments, and contains interesting side notes on the subject being explored.

Hands-On = Up to the Elbows

When I first opened this product, my mind flashed back to my youth and the Erector Sets and other gadgets I played with for hours on end. I have always been a strong believer in tinkering. As a result, when I connected the Science Toolkit to my IIc, I knew that the rest of the day would be spent in pure Tinker mode. It was time to ask "what if" and to play with science with the spirit I had as a child.

I connected the light sensor to the strip-chart recorder and moved my hand back and forth in front of the photocell. The recorder drew a curved line that followed the rhythm of my hand movement, which led me to create a small experiment on pendulums. I found a small rock that I connected to a piece of string. I tied the other end of the string to a tripod so that the rock could swing toward the light sensor. As the rock moved back and forth, the strip-chart recorder drew a periodic pattern that measured the time of the pendulum swing pretty accurately. I realized that by changing the string length and noting the difference in the pendulum's period, students could use this apparatus to discover the laws of pendulum motion.

Next I had another thought: If I could do so much with the few programs in this toolkit, imagine how much I could accomplish if these tools were integrated with a programming language such as Logo.

Because the Master Module connected to the game port, I could examine the signals generated by the temperature and light sensors by reading the PADDLE values from Logo. Within a few minutes I had created a crude Logo program to record light signals over time:

```
TO CHART :TIME :DELAY
IF :TIME > 100 [STOP ]
SETPOS SE :TIME PADDLE 1
WAIT :DELAY
CHART :TIME + 1 :DELAY
END
```

This program (written in Apple Logo II) plots the value of PADDLE 1 (the port that contained the Toolkit's light sensor) as a function of time. By using different values for :DELAY, I could change the time it took to complete the graph.

Once again, I set up the pendulum experiment, only this time I used the Logo program instead of the software that came with the toolkit. I set the Logo turtle at the left edge of the screen, started the pendulum swinging, and entered CHART –100 0 to start the graph. The result showed both the periodic nature of the pendulum motion and also the damping of the pendulum movement over time (see figure 1).

Although this graph isn't as pretty as the one created by the software that accompanies the Science Toolkit, I don't care. The important point is that the Science Toolkit is compatible with another excellent discovery-based learning environment: Logo.

The mixture of Science Toolkit and Logo is greater than the sum of their parts.

The mixture of these two components is greater than the sum of their parts. I applaud the creation of the Science Toolkit by Lauren Elliott and Scott Shumway, I applaud Brøderbund for bringing the product to market at such a low price, and I applaud the creators of other products that perform similar tasks.

Until now, the computer has been a supplemental tool in the science classroom. It may soon become a key component of many courses. +

Dr. David Thornburg is the author of numerous books and articles on computing and is a regular contributor to this magazine. He has been interested in educational computing since the late 1970s and is the inventor of the Koala-Pad and the principal designer of the Muppet Learning Keys. Most recently, he designed Calliope, an "idea processor" for the Apple II and Macintosh that is of special interest to writing teachers in grades 5 through college. He enjoys hearing from readers—you can reach him in care of this magazine.

PRODUCT INFORMATION

Science Toolkit
Brøderbund Software
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List Price: $49.95
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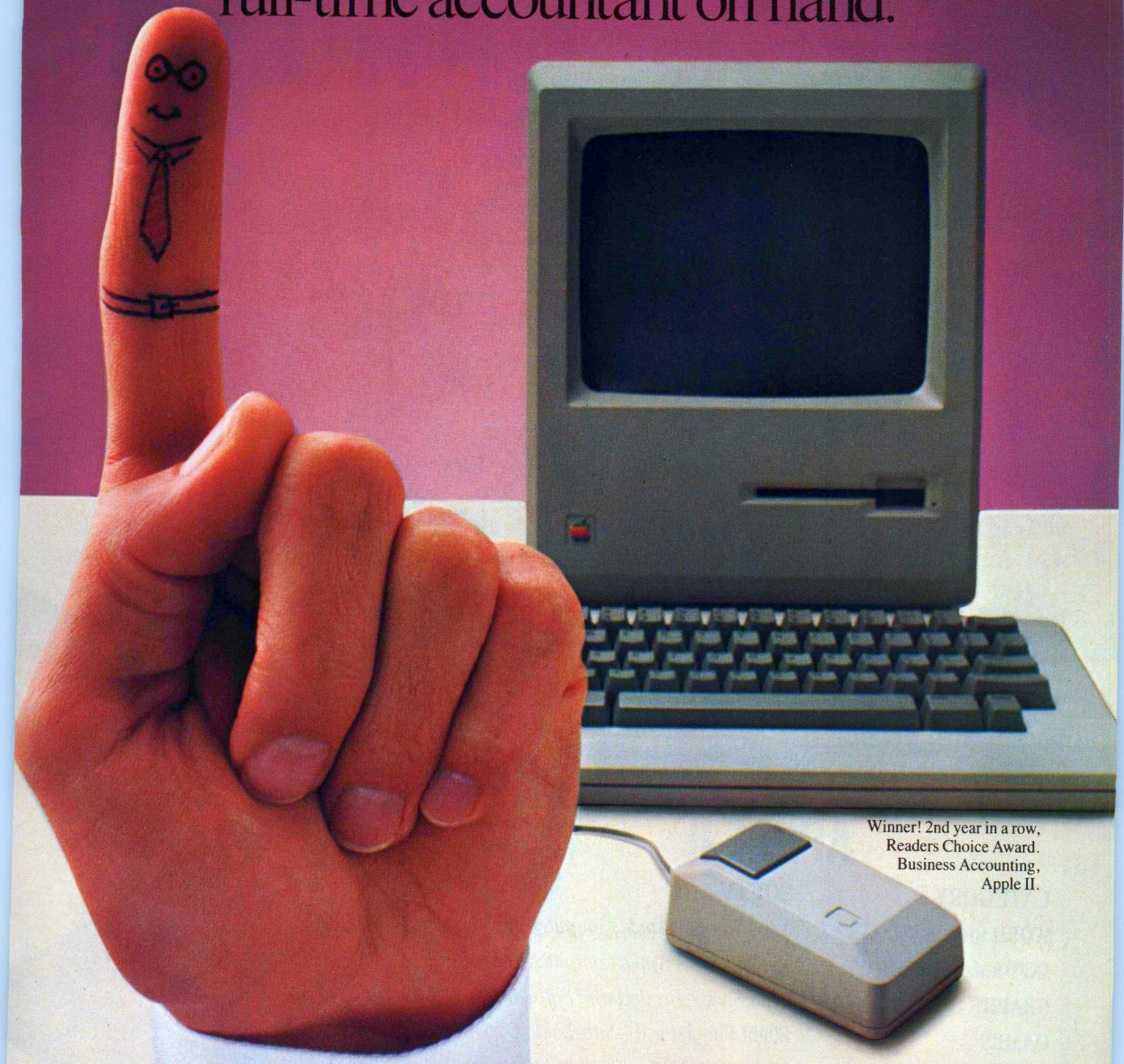

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EDUCATION	Sticky Bear ABC—*Field Publications*
BUSINESS ACCOUNTING	BPI Accounting—*BPI Systems*
PERSONAL FINANCE	Dollars & Sense—*Monogram*
SPREADSHEET	AppleWorks—*Apple Computer, Inc.*
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PERSONAL FINANCE	Dollars & Sense—*Monogram*
SPREADSHEET	Multiplan—*Microsoft*
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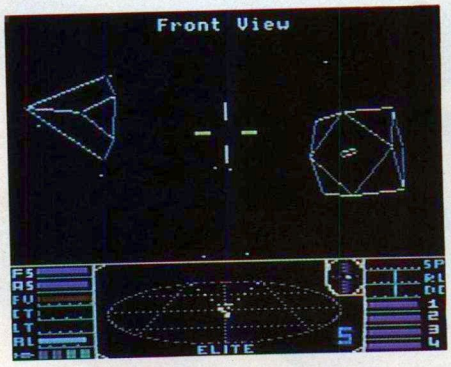

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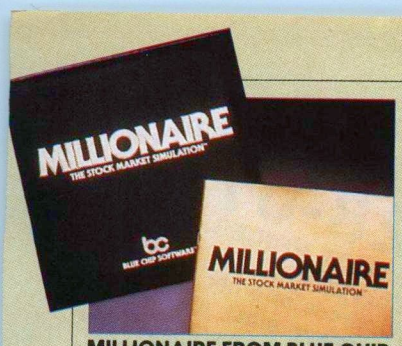

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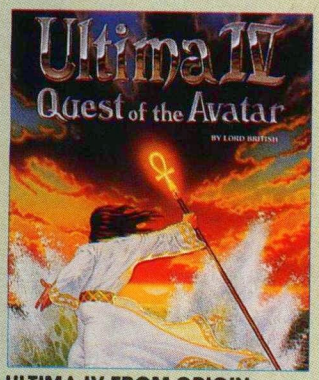

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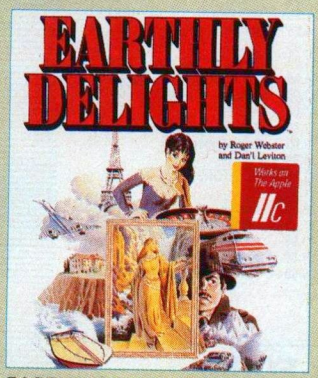

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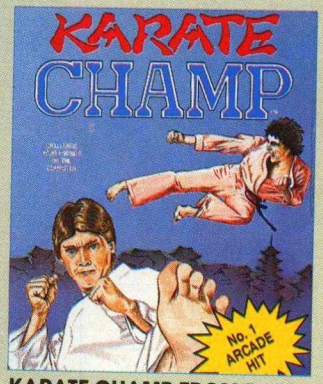

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GENIAL PURSUIT

About five or six years ago, an entertaining electronic gizmo called Simon swept into the hearts and homes of America. This circular toy sounded a tone and simultaneously lighted one of four brightly colored buttons. To play with it, you pressed the buttons in an attempt to repeat the Simon-generated sequence. Simon started with one tone and then added another each time you repeated the sequence successfully. It was an easy enough task, at least for the first half-dozen tones or so. After that, you realized the worst of your Pavlovian nightmares.

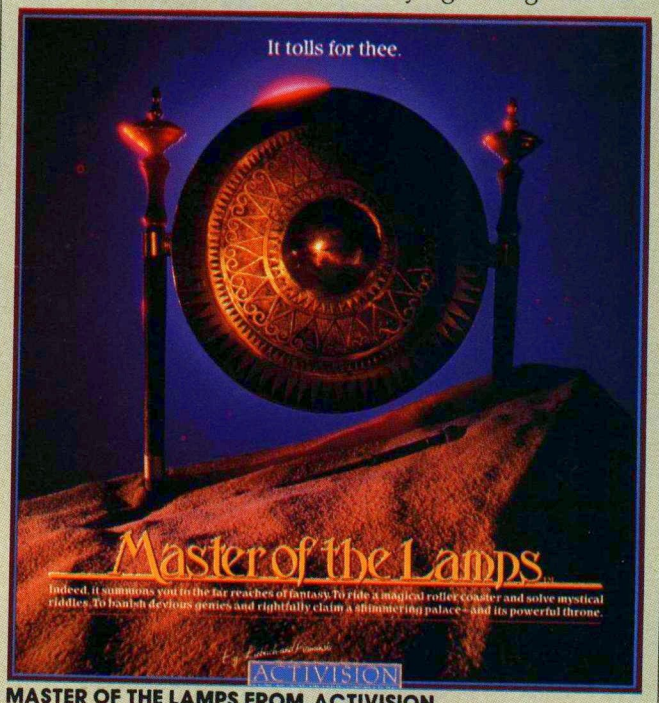
The Simon fad has pretty much died out—or has it? Activision hopes not, for Master of the Lamps is an attempt to resurrect Simon, increase its complexity, wrap it in Middle Eastern mystique, and include a magic-carpet "flight simulator."

With the king dead, three evil genies escape their lamp prisons and threaten death and destruction for all the land. As the young prince, you must restore order to the realm by stuffing these spirits back into the lamps. Each lamp is broken into seven pieces, however, and each piece is hidden within the genies' dens.

You must fly your magic carpet through tunnels composed of diamond-shaped gates. Success brings you into the den; failure whisks you back to the beginning of the tunnel. Unlike so many other games, Master of the Lamps does not condemn you to death if you fail. This game makes you start only a tunnel over again, not the entire game. This aspect curtails a lot of frustration, precludes the boredom inherent in starting a game over, and encourages you to complete the game.

Once you're in a den, you're confronted with eight gongs, each with a different sound and color. The genie sounds tones and/or displays colors, and you race up and down the octave striking the gongs. If you mimic the genie's sequence correctly, you gain a piece of a lamp. Do so 21 times, and all three genies are reinserted into their lamps.

Flying through the dia-



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Master of the Lamps is a colorful game and certainly challenges your memory. The nonlethal consequences of missing a gate or tone enhance the enjoyment of the game, especially for younger family members. How nice to see a game that does not blow your computer alter ego to bits and pound your ears with peals of electronic raspberries. All in all, Master of the Lamps provides solid family fun.

Russ Lockwood

Master of the Lamps
Activision
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The investment vehicles that are at your disposal include common stock and options. You can even margin (borrow against part of your investment) as a financing tool. In all the other Blue Chip games, you have to earn the right to use various investments, and Millionaire is no exception. As a novice, you can buy stock only for 100% of its face value, with no margin at all. When you make it to broker status (having earned $90,000), you are able to buy stocks on margin and borrow up to 80% of your net worth, as well as buy call and put options.

Millionaire includes a good discussion of the various investment types, as well as some general market information. As always with Blue Chip games, up to 14 people can play. At the end of the 91-week period, your portfolio is turned into cash, and you start again. If your net worth drops below $1000, you have to start again, but your old buddies lend you $7500 to "get back on your feet again."

Millionaire is a good learning tool for real market novices, but playing a stock on paper (following its performance as though you had bought it) and buying a good book on the market is probably just as valuable.

True, a book doesn't have all the flashy graphics or the sex appeal of using a computer, but odds are that Millionaire won't help make anyone but the folks at Blue Chip richer, or better off.

Ken Landis

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Blue Chip Software
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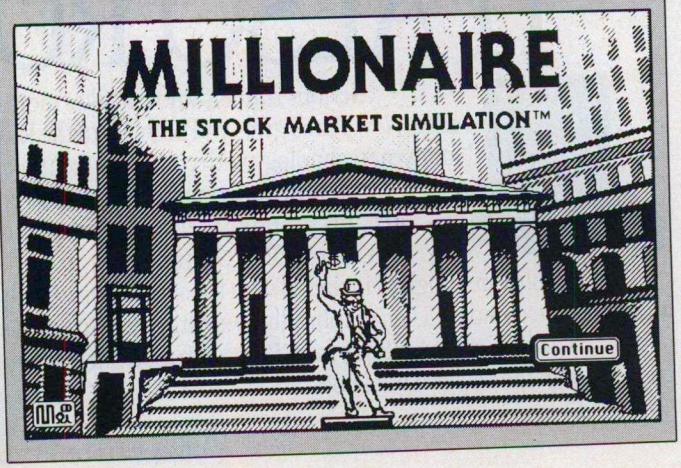

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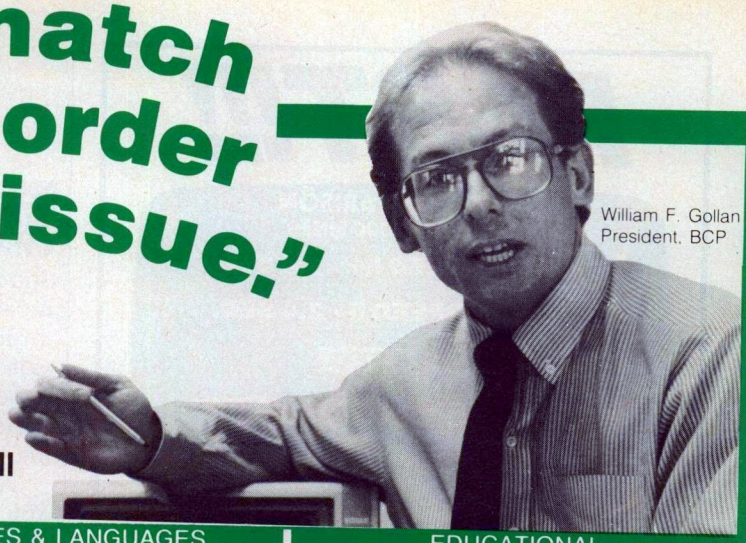

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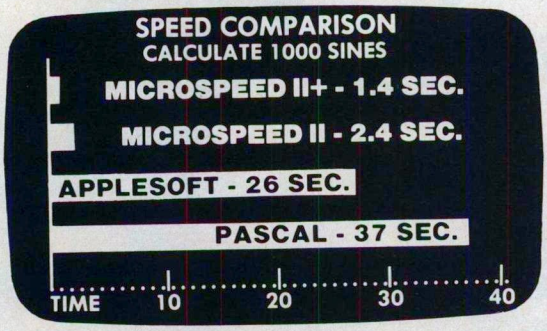

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That's Entertainment

THE *ULTIMA*TE CHALLENGE

Sound the trumpets! Let heralds proclaim the news throughout the countryside: Lord British has released the fourth game in his epic fantasy/role-playing series, Ultima IV.

Was it worth the wait? You betcha!

With the flair and attention to detail we have come to expect from him, Lord British far surpasses his previous efforts, both in intent and execution, in his newest adventure.

You must always speak the truth, as your lies may haunt you.

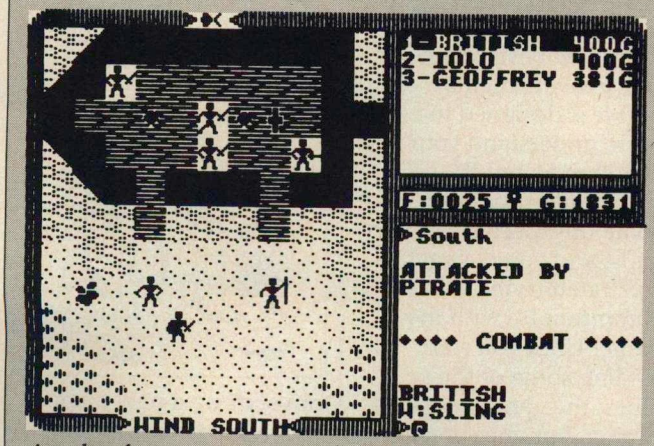
The same hybrid elements that made Ultima I, II, and III successful are present in the new one. It has dazzling hi-res screens; arcade-like combat; adventure-like text input; and, for those with Mockingboard-enhanced sound, an original musical score. In case you were worried, you don't have to be familiar with the other Ultima games in order to enjoy this one fully.

Ultima IV is subtitled "Quest of the Avatar," and although it has many interior quests, the main goal is for your computer-controlled character to become an avatar. According to *Webster's New World Dictionary,* an avatar is a concept of the Hindu religion, and it signifies either "a god's coming down in bodily form to the earth" or the "incarnation of a god." Unlike so many other games whose thrust is to save mankind from some destructive evil being, Ultima IV presents you with the ultimate challenge, the self.

The background story linking all the Ultimas is detailed in one of the two superbly executed manuals that accompany the two-disk, four-sided game. The other booklet describes the intricate magic system available to the characters. You also get a metal ankh, the ancient Egyptian symbol for life, and a beautiful cloth map showing Lord British's realm.

From the moment you first boot the game, you will feel as though you are being pulled into the screen. Forgive me for not spelling out the specifics for you. I want to give you the basic flavor of the game, not to spoil your fun.

You see, the quests of Ultima IV are meant to be revealed slowly as you travel the lands, talking with the populace. Yes, *talking*. One of the fascinating features of Ultima IV is the ability to have rather full conversations with all of the people (and some of the animals) you encounter. It is through these conversations that you find out what you need to do, why, and how. You mustn't skip anyone, and you must always speak the truth, as your lies may come back to haunt you. Like a sleuth in a complicated detective story, you must unravel the huge jigsaw-puzzle network of suggestions and clues. You will undoubtedly have to return to a few of the people you have spoken with pre-



viously after someone else in some other town tells you to ask the first person about something specific.

Interesting tidbit: Being a modern lord, Lord British has included a goodly number of female characters among the populace. No sexism here!

You must take extensive notes as you play. My notes have run upwards of 30 pages. It is impossible to get very far in the game without being able to refer back to things you've learned earlier.

As in the previous Ultimas, monsters galore await you: a whole bestiary from bats to zorns. And what would an Ultima be without fighting? When you come upon an evil creature, you and your companions must engage in combat. Unlike in the earlier games, you do not have to fight to the finish; in this one you may retreat—but you are told that a valiant fighter never flees uninjured. Luckily, your character's injuries can always be cured by magical means.

You start your travels through Lord British's lands on foot. Later, you can go on horseback (that is, if you can figure out how to get a horse). You will also have to defeat a group of pirates and commandeer their ship so that it can transport you to mysterious islands. In addition, you will discover the illusive "moon gates" that permit instantaneous teleportation of your party between two remote places. Finding the moon gates and figuring out where they take you is part of the adventure.

As you can well imagine, Ultima IV is not a simple game. Neither is it a game for those who want to play a little while, put it away, and come back to it whenever the mood strikes. This game takes work, concentration, and a large time commitment. It is splendidly rewarding, though—detailed, intriguing, rich, and colorful. Ultima IV has more play-value for its money than almost any other game I've ever seen. I figure I'm about at the halfway mark by now, and although I know it must, I don't want it to end.

Donald Oliver

Ultima IV
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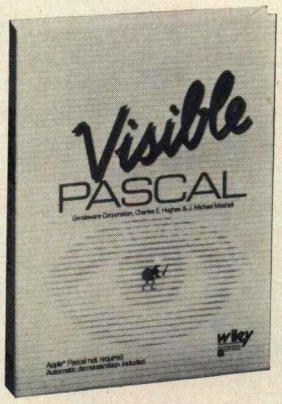

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That's Entertainment

THE MYSTERY OF A PECULIAR INHERITANCE

This interactive adventure game will lead you to other parts of the world. The mystery will unfold in different ways, depending on how you go about looking for the solution. You read a passage of text, and then you are prompted to decide what to do next. After you give your answer in a short English statement, Earthly Delights will reply or go on with the next part of the story.

Here's the scenario: Your favorite uncle, from whom you haven't heard in years, has just died. He's left you a peculiar inheritance, a painting of a beautiful woman and a note. In the note, he stated that the painting, *Earthly Delights*, was for enjoyment and was not worth much in the art market.

Soon after you take delivery of the picture, a stranger comes to your home, offering to buy *Earthly Delights* for $75,000 cash. Remembering your uncle's note, you flatly refuse to sell.

The next night, you are in bed, alone at home, when you are awakened in the middle of the night by a strange, faint, scraping sound coming from another room.

The rest of the story is up to you!

The object of the game is to find the best possible solution to each problem. If you are not satisfied with the solution, then perhaps you have not found the best one.

Earthly Delights' parser is designed to try to understand your commands, but it sometimes produces some unexpected results, and you may get frustrated trying to communicate with the game. Until you start finding some of the clues, the game may be boring, but once you get into the story, it will become a challenge, one that will keep you absorbed for more than a couple of hours.

You can save up to five sessions of the game and return to the one of your choice—it's almost impossible to have two identical games. The neat thing about this game is that if you solve the mystery, you

can start up a new game and come up with different clues and maybe even a different solution.

Another feature allows you to print your story on a printer. I suggest that you use this feature only for printing important parts for reference, unless you have a lot of paper you want to waste.

Earthly Delights comes with documentation that helps you get started and

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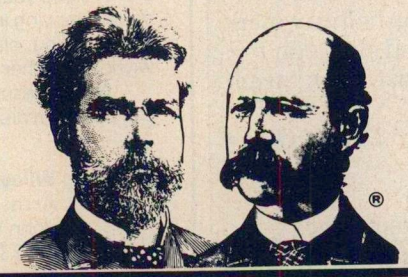

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1	ADDRESSES
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1	ALMOST
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8	YOUR

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includes hints and a map. The company offers a 30-day guarantee: If for any reason you are dissatisfied, you may return the game for a full refund.

Psst! Keep all of the equipment and clues that you find, as they may be invaluable to you later in the game. Oh! Be sure to talk to the bartender. I think you will enjoy Earthly Delights.

Tom Dennis

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MARTIAL-ARTS MADNESS

Warning: This is going to be a schizophrenic review. On one hand, Karate Champ is not my kind of game, and on the other hand, I know it is very popular with others. So, to be fair, I will use both hands to explain why I don't like it and why I think you might.

Karate Champ is a home-computer version of the immensely popular arcade game. I personally have seen kids grouped around the machine with fistfuls of quarters in their hands waiting to play it in video arcades from New York to San Juan.

This new home version puts you in a series of karate matches staged at various colorful locations. Your objective is to clobber your opponent as often and as quickly as possible by kicking and punching the living daylights out of him. Each match consists of a series of rounds. Two points win a round, and two rounds (out of three) win a match.

Your objective is to clobber your opponent by kicking and punching the living daylights out of him.

You can play the game against a computer-controlled opponent, or you and a friend can play against each other. Karate Champ gives you a choice of 36 different moves: 18 if your player faces right and the mirror image of the identical 18 if your player faces left.

You can use either a joystick or the keyboard to control your fighter. On the joystick, you effect all moves by pushing the stick into one of eight positions; for some of the moves, you must also press the fire button simultaneously. You get a chart that clearly details all the moves and shows their stick combinations. Using the keyboard requires becoming familiar with 22 different key commands. Sound complicat-

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ed? Wait until you try doing it in an actual game!

Understandably, mastering the moves is crucial to success. A helpful hint in the documentation suggests that in order to familiarize yourself with the techniques, you should select a two-player game from the Options screen and play against an invisible person. Your opponent's player will remain static, so you can learn the varying characteristics of your moves. What the manual doesn't mention is the catch: the matches last only 30 seconds; while I was busy moving my eyes from the chart in the manual to the screen to see how the moves worked, the round was over.

When you play against a friend, one of you uses the joystick and the other must use the keyboard. All I can say is that *I* wouldn't want to be the one using the keyboard.

From the other side of my mouth, I should add that the joystick controls are laid out sensibly, and I suppose that if I played the game for a while, I'd become better at it—after all, all arcade-type games take some time to master.

Because the visual sophistication of Karate Champ's screen wasn't up to my admittedly high standards, I didn't enjoy watching the game as I played. You see, I have been spoiled by the slick visuals of another karate game, Brøderbund Software's Karateka. In that game, the hero can execute only six moves

(three punches and three kicks), but the animation is smooth and smart. Karate Champ's players move choppily—the smoothness is apparently sacrificed for more movement possibilities. Comparing these two games is probably unfair, though, as they attempt and accomplish different things. Nevertheless, how many karate games does one household need?

The Apple version of the game, unlike the Commodore version, contains no bonus round (boo!).

Now, as promised, the other side of the coin: Karate Champ is fast-moving, colorful, and action-oriented. For these reasons, it is often requested by visitors to my household and is popular with many younger players. Now if only Brøderbund Software would take a look at Karate Champ and then release a Karateka II . . .

Donald Oliver

Karate Champ
Data East USA, Inc.
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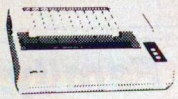

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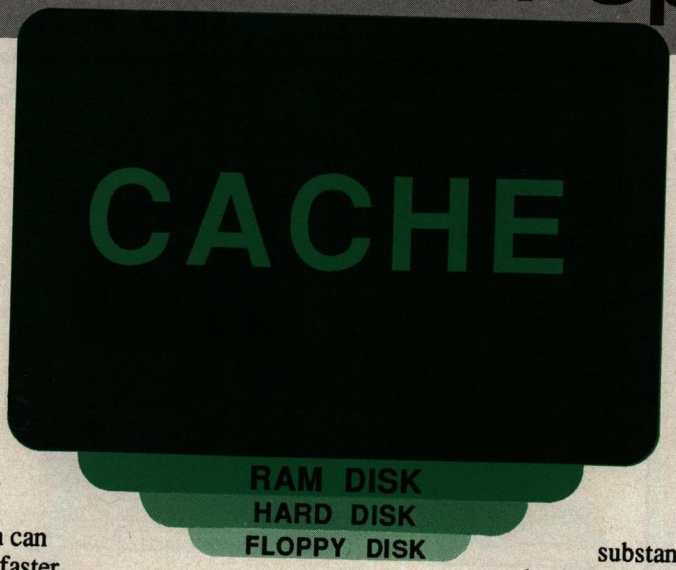

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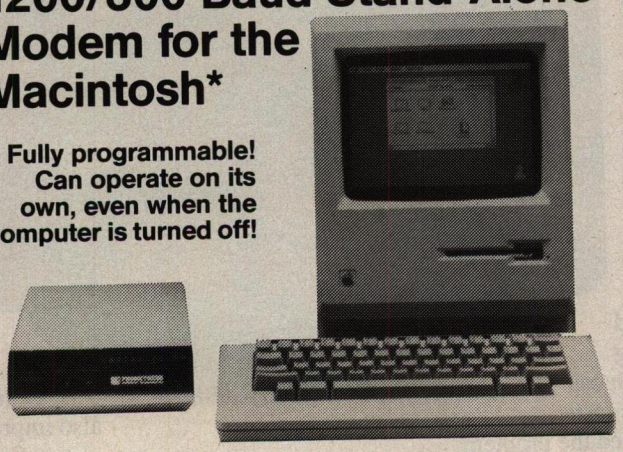

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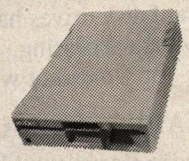

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**When using CP/M, the JE860 and JE868 will only function with Version 2.20 or earlier; PASCAL (JE868) Version 1.1 or earlier.

CIRCLE 279 ON READER SERVICE CARD

BY MICHAEL WIESENBERG

A TWIST ON LAST MONTH'S PUZZLE

A return visit to the store provides a new challenge

CUBIE WARMING PARTY! The sign is in ten-inch letters, printed one letter per page on an IQ98636A high-speed laser printer, the unseparated fanfold pages strung above the cubicle that is jointly occupied by Maria Lopez-Goldblum and Sally McRae, members of the FORTRAN team of I-Q Industries in the heart of Silicon Valley.

Because of overcrowding at this site, caused by a miscalculation in space allocation while the building was still under construction, some employees now have to double up in cubicles approximately 50% larger than the single-person cubicles that had until recently been the standard. Lopez-Goldblum and McRae are the first in the FORTRAN group to become cube-mates, and they are celebrating with a party. McRae has brought containers of Coppa Mista, mocha chip, dark chocolate, and strawberry from Gelato Classico, and Lopez-Goldblum has contributed chips and dip, fruit juice, and soft drinks.

Spotswood Gilbert, R&D engineer, leans against one of the portable Herman Miller ergonomic partitions that separate this new double cubicle from its neighbors. "How are the tests coming?"

McRae wrote the test suite for the new FORTRAN 8X compiler that will be on all of I-Q's new RISC computers. Her programs try out all features of the compiler, ensuring that its responses are strictly in accordance with ANSI specifications. "I'll have another report out next week, but I can tell you that we're seeing fewer than 5% failures."

Bob Levin, hotshot FORTRAN jockey, is wearing his customary work outfit: frayed, beltless jeans; moccasins; and a Grateful Dead T-shirt. "Yeah, and I'll bet most of the 5% are the ATS hooks."

Bob Levin, hotshot FORTRAN jockey, is wearing his customary work outfit: frayed jeans, moccasins, and a Grateful Dead T-shirt.

Grey Scrivener, technical-writing specialist, scoops mocha chip and dark chocolate into a plastic bowl. "ATS hooks? What are those?" The generic FORTRAN manual is his responsibility. He is suspicious, because the lab has added new features at other stages in his writing of the manual without bothering to inform him.

Gilbert pours a caffeine-free diet Coke. "We're trying to look like a 4GL—you know, Fourth-Generation Language—so we're adding a bunch of keywords, all of them I-Q FORTRAN extensions to the ANSI standard, that directly interface with automated test systems. Marketing figures that's a good way to compete in the CAM world."

"Right, computer-aided manufacturing. That article in the *Journal* said we were trying to make our presence felt there. If you folks would be so kind as to give me the specs on the new keywords, I'll get them into the manual."

Levin grabs a handful of chips and a Dr. Pepper. "Remember the 7-11 puzzle? Well, my friend at Hewlett-Packard Laboratories, Thomas Ryan,

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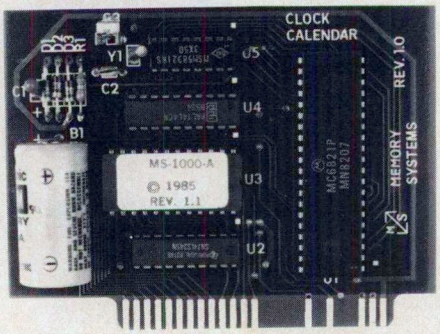

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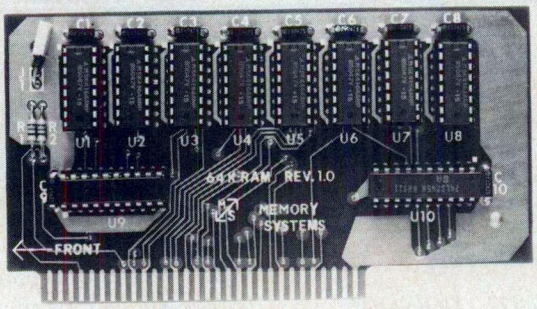

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CIRCLE 103 ON READER SERVICE CARD

sent me an interesting variation on it that I think someone could solve by modifying the same program."

That same mathematician returns to the same convenience store, again buying four items, each costing an integral number of cents, from the same clerk, who again enters the purchases on a desk calculator and presses the equals key.

The mathematician pulls ten dollar bills from his pocket, handing over just enough of them to cover his purchases. "Are you aware, young person, that you hit the times key between each purchase, instead of the plus key?"

"Oh, sorry."

"Don't worry about it; the total was the same as it would have been if you had used the plus key. Why don't you enter the four prices again and press the subtraction *key each time. This time you should get the amount of change you owe me."*

"Why, so I do."

"How much did each item cost?"

Scrivener switches on McRae's smoke-chasing miniature fan as system operator Marion Smith appears, cigarette in hand. "I suppose, like the last time, this *could* be solved with four nested loops, but not in my lifetime."

Smith carefully puts out her cigarette before joining the cubie party. "I see the NO SMOKING sign, Grey. You don't need the fan."

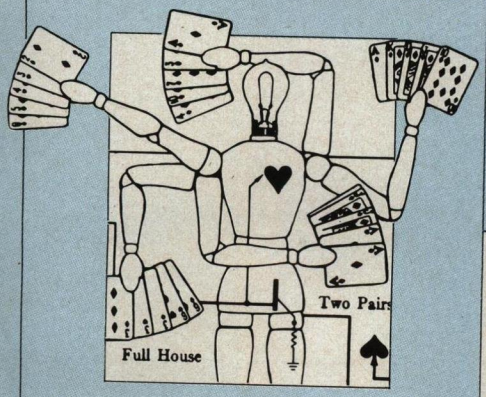
The Challenge

Don't throw away last month's program, folks, because you can build on it for this puzzle. Send us a complete program that determines the prices of these four items and that further demonstrates that the answer is unique. Your program must be short and elegant, in any programming language that runs on any Apple computer. The best solution wins you a one-year subscription (or extension) to *A+* and a Certificate of Excellence in Programming and will be published here. Remember that a good program is self-documenting.

All entries for this month's column must be received by April 10, 1986. Please send all entries to Computer Calisthenics, c/o *A+* Magazine, 11 Davis Drive, Belmont, CA 94002. If you want us to return your entry, enclose a self-addressed, stamped envelope or diskette mailer. The winner will be selected by the author, whose decision will be final. The winning program will be announced in the July 1986 issue of *A+*.

COMPUTER CALISTHENICS

JANUARY'S WINNER



Michiharu Ariza

The response to the January card-shuffling puzzle was overwhelming. Entries were certified, expressed, and special-delivered. Some were pages long and had obviously taken hours to produce; some contained beautiful drawings illustrating the shuffling process.

I wish I could write each of you a personalized response, but the volume doesn't permit it. I also wish I could award each participant a prize.

Nearly half the entrants submitted what I consider to be the fastest and most efficient shuffling algorithm, summarized in Jason Eldbaum's single line of pseudocode:

```
For each card C in the deck, from DECKSIZE down to 2, swap the Cth card with a card chosen at random from cards 1 to C inclusively.
```

Jason, by the way, is 14; he gets an honorable mention.

In BASIC, it looks like this:

```
10 FOR X = DESKSIZE TO 2 STEP -1
20 T = INT(RND(1)*C) +1
30 TEMP = CARD(T)
40 CARD(T) = CARD(C)
50 CARD(C) = TEMP
60 NEXT C
```

Mark McCulloch, of Freehold, New Jersey, gets a mention for the shortest program (one line) implementing this approach.

The entries I liked best attempted to simulate "real" shuffling: for example, splitting the deck in half, randomly dropping a few cards from the bottom of the left half, dropping a few more from the right half, and so on until the deck is mixed—then cutting the cards and doing it again a few more times. That's the way *people* shuffle; unfortunately, their method is neither fast nor efficient.

I also commend those whose programs displayed "real" cards (rather than their ghostly, though machine-readable, numeric equivalents) and who showed their algorithms at work in actual card games. Congratulations also to those who demonstrated within their programs the actual randomness of their newly shuffled decks.

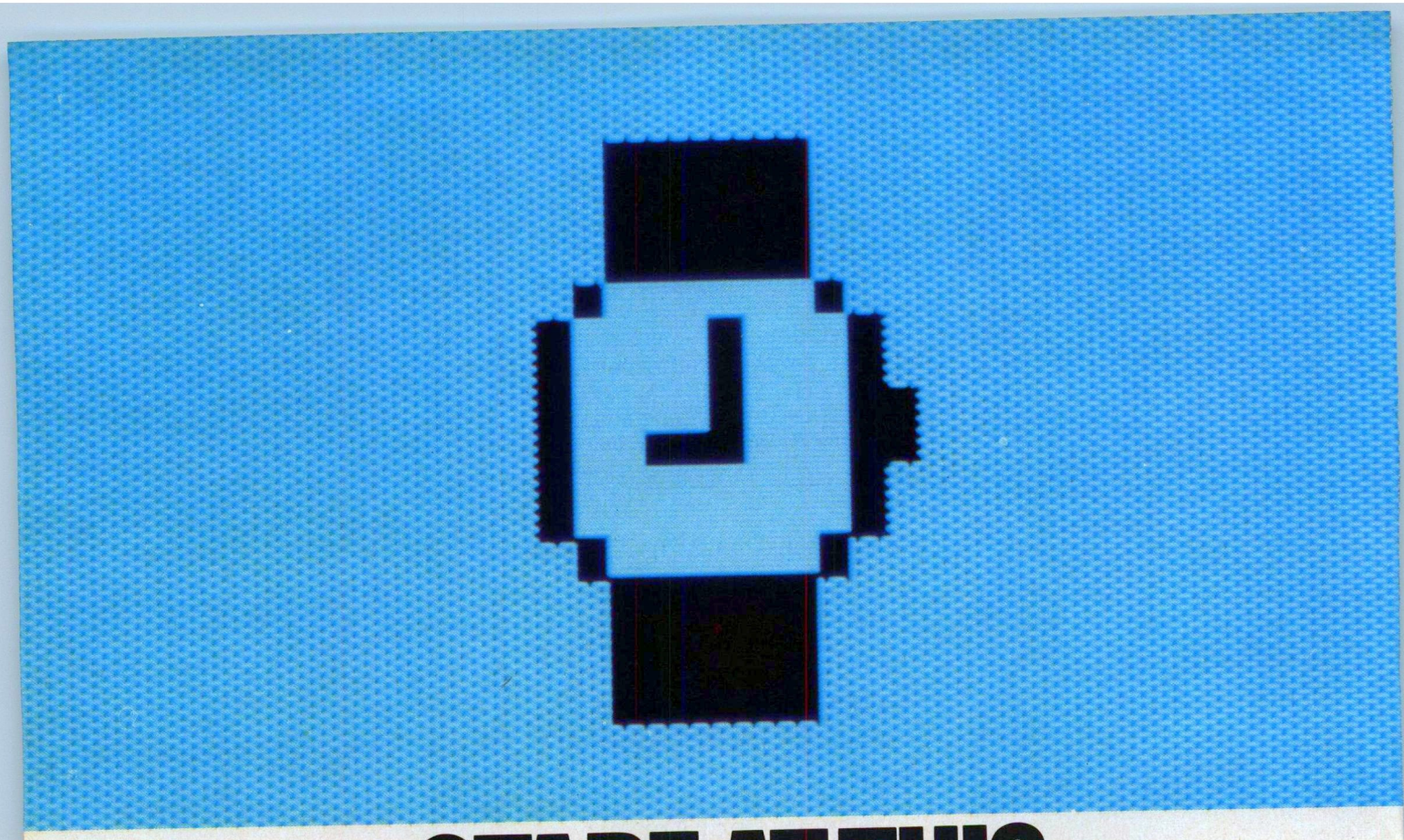
And the winner? The envelope, please. Michiharu Ariza, of Yokohama, Japan (see program below).

By the way, I had begun to fear no women would enter, until Wendy Faulkner, of Moseley, Virginia, became the first. Hoenie Luk, of San Francisco; Sharon Aker, of Sussex, New Jersey; Ann Turner of Menlo Park, California; and Vivienne Craig, of Foster City, California, also entered the contest. +

```
program CardShuffle;

 const
  DeckSize = 52;
 type
  DeckArray = array[1..DeckSize] of integer;
 var
  Deck : DeckArray;
  i : integer;
 procedure Shuffle (var Deck : DeckArray);
  var
   n, i, temp : integer;
 begin
  for n := DeckSize downto 2 do
   begin
    i := Random mod n + 1;
    temp := Deck[i];
    Deck[i] := Deck[n];
    Deck[n] := temp;
   end;
 end;

begin
 for i := 1 to DeckSize do
  deck[i] := i;
 Shuffle(Deck);
 writeln('     No.    Card');
 for i := 1 to DeckSize do
  writeln(i, Deck[i]);
end.
```



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To demonstrate the second best reason to own a HyperDrive, stack fifty diskettes atop one another. HyperDrive holds up to that much data without enlisting outside help from any diskettes at all.

The next demonstration will require a little imagination. Imagine a Macintosh with software that protects your data against loss by copying it onto diskettes. A print spooler that lets you go on to other jobs while your printer is occupied. And a security program that protects your files from unauthorized entry. You've just imagined a Macintosh with HyperDrive.

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A+/APRIL 1986

Macintosh

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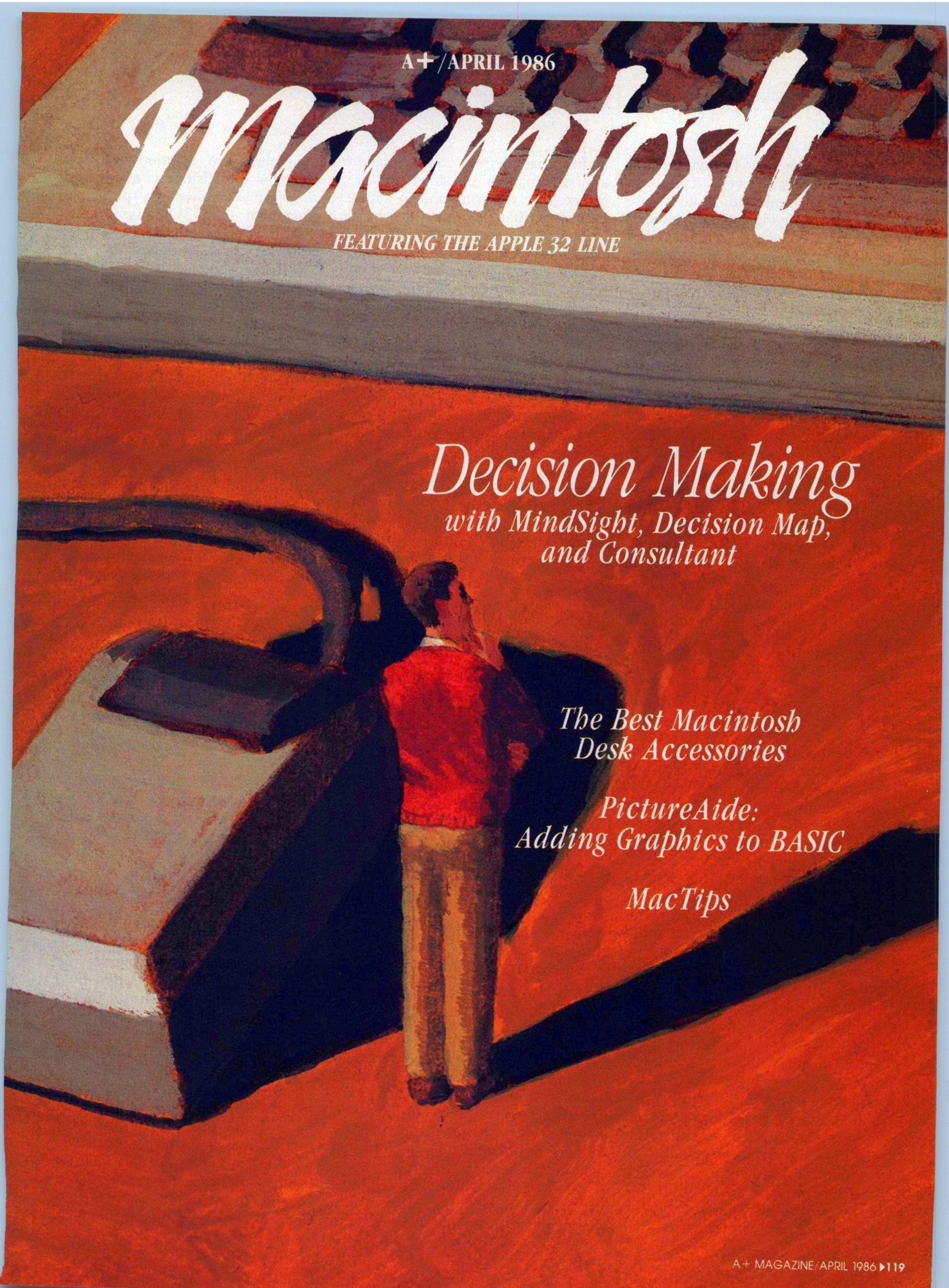

Decision Making
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SOFTWARE

BY SHARON ZARDETTO AKER

Decisions, Decisions!

MindSight, Decision Map, and Consultant: three approaches to decision making

We all have to face a myriad of decisions every day, both personal and professional. You made a terrific decision when you bought a computer, and now you can use your Macintosh to help you make other decisions. How? With decision-support software.

It's exciting to see a new category of software developing in personal computing, but—as with any new field—its definition and boundaries are a little fuzzy right now. A decision-support system helps you solve complex problems by organizing, evaluating, and calculating their many factors. A basic spreadsheet can serve this purpose. You put in all the facts at your disposal, try a few what-if projections, and take a look at the bottom line. A decision-support program, however, doesn't make you set up a complex spreadsheet and figure out the formula you need in any given cell. Some programs even let you handle decision situations that don't call for numbers at all, such as deciding which job candidate to hire or how best to satisfy two opposing sides in a contract negotiation.

Three new products for the Mac belong to this new software category. Two of them are excellent programs; coincidentally, one supports quantitative decision making and the other qualitative. The third package is a disappointing on-screen textbook in decision theory.

MindSight

When is a spreadsheet not a spreadsheet? When it's MindSight. Since a spreadsheet can act as a decision-support system, it's no surprise that MindSight has many of the functions of a spreadsheet. The surprise is just how superior this software is to a standard spreadsheet for basic decision support.

MindSight introduces a new vocabulary. A *model* is a list of statements that define your situation; although many of the statements are, of necessity, mathematical in nature, they are written in English. A *solution* is the numeric representation of your model—a spreadsheet.

The overall operation of MindSight is, in a word, smooth. When you have multiple windows on the screen, you can use the Put Aside command on any of them—the window shrinks down to an icon at the bottom of the screen, ready for immediate recall (see figure 1).

To set up your model, you type a series of statements in the model window, such as:

```
Revenues =Price* Units Sold
Price =150
Labor per Unit =57
```

The modeling language is sophisticated and gives you many ways of entering information that will figure into the solution. Here are some examples of column definitions:

```
Columns 1986 thru 1994
Columns Jones, Smith, McGrath
Columns 500, 1.8* previous
```

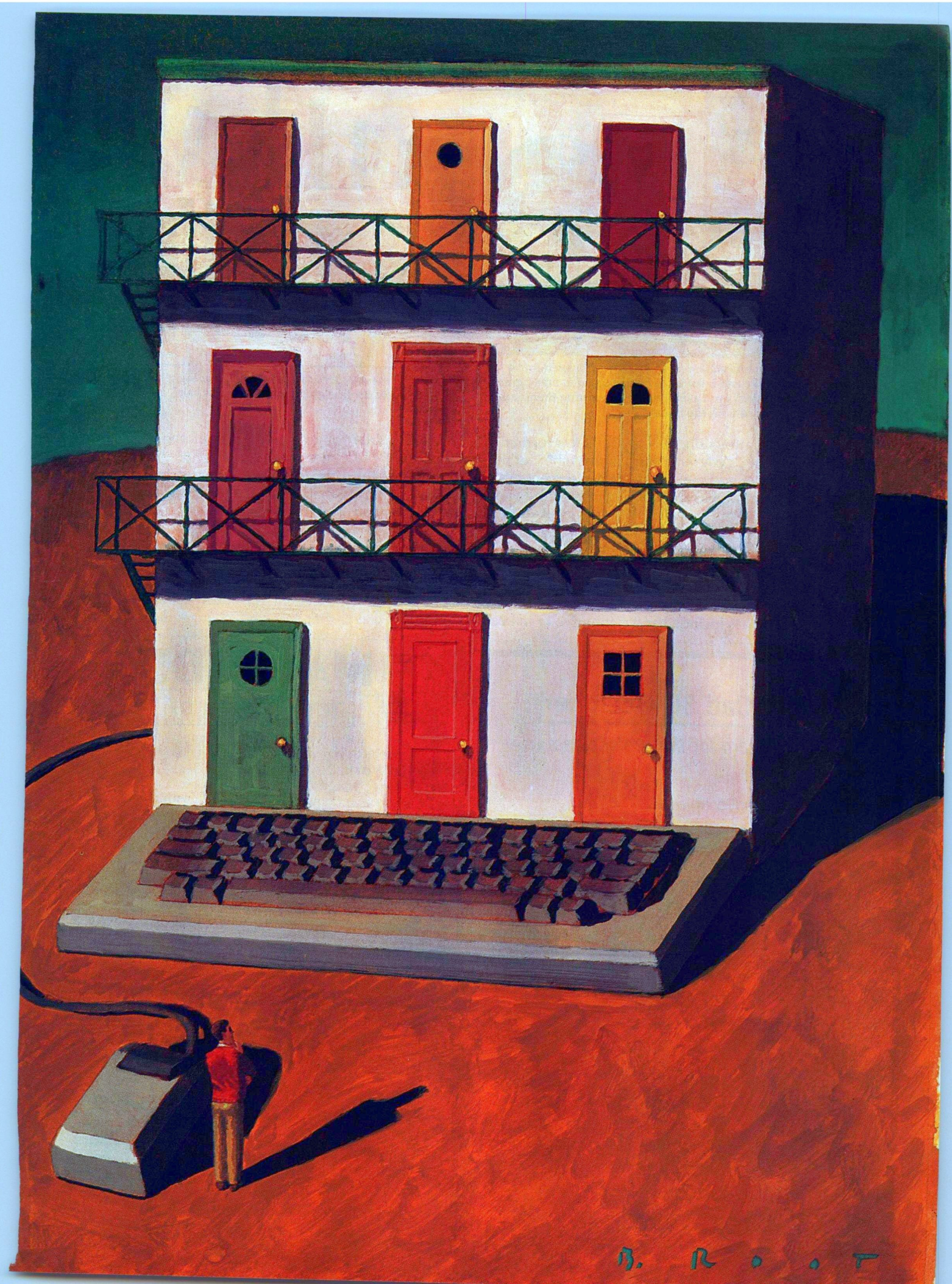
The row titles—*variables*—are taken from the first phrase in the modeling statements: Revenues, Price, and Labor per Unit in the examples above. Intrinsic functions and "subroutines" are available to save you time in entering statements for such things as straight-line depreciation and amortization.

If you choose the Solve Model command, the solution appears in a familiar spreadsheet form. You can manipulate the solution in many ways; the spreadsheet's basic what-if capability is handled in a special and convenient way. When you select What If from the Interrogation menu and enter your alterations, the solution (spreadsheet) changes, but the basic model is not affected at all. Taking the opposite approach, you can specify a goal, and the solution calculates backward, altering the components that you would have to change to reach that goal. For instance, you can define your goal as Profits=5000, previous *1.12 (profits at 5000 in the first column, increasing by 12% for each subsequent column), and designate Units Sold to be the changing variable. The figures in the solution, including any dependent variables, change so that the profit figure reflects your target. You can save any what-if situation separately as a "case" that you can recall when you need it.

If MindSight stopped there, it would be a useful product, but its selection options push it into the must-have category for a lot of users. You can, at any time, create a subsolution from the main model. You can select only certain columns to be displayed, only certain variables (rows), or any combination of each. The rows and columns do not have to be contiguous, so you can set up a solution that shows only Revenues, Units Sold, and Profits for the month of January for five different years, for instance. You can "interrogate" the subsets the same way you do the main solution, using What If and Goal Seek.

MindSight also boasts a plotting function with numerous options. You can make bar, line, and pie charts with various backgrounds and optional legends and titles; the graphs can be of the entire solution or only selected portions. This plotting function is not

BARRY ROOT


B. ROOT

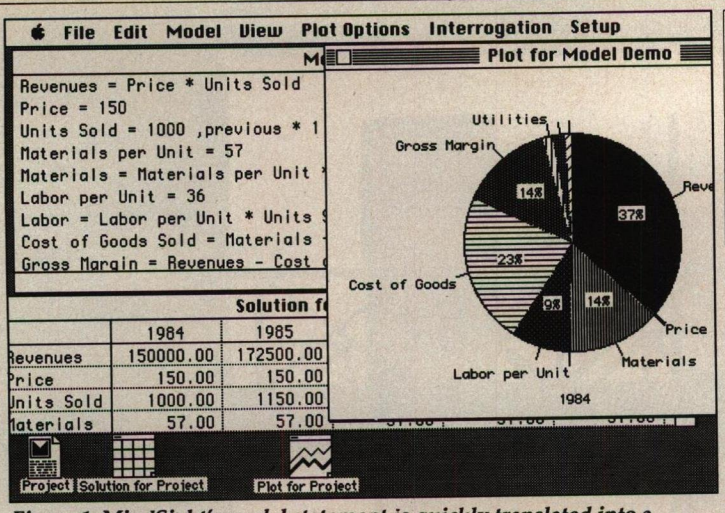


Figure 1: MindSight's model statement is quickly translated into a spreadsheet-like solution, and results can be displayed in many graph formats. You can temporarily put aside windows, turning them into icons that can be reopened with the mouse.

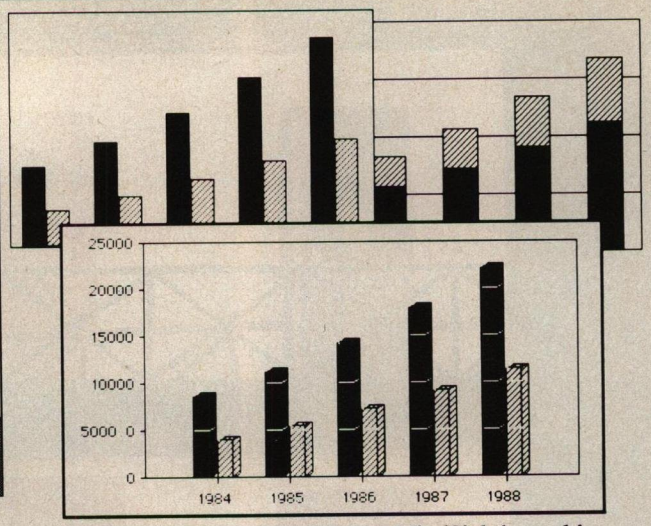


Figure 2: These are three samples from MindSight's graphing option. Pie charts, line graphs, and 'percent bars' are also available.

just an extra added attraction; it is a full-featured charting program that lets you set minimum and maximum values as well as scaling factors. You can even choose three-dimensional bar charts or an unusual "percent bar" chart (see figure 2).

You can create reports from any set or subset of information, and, although MindSight has many options that control what data is included and how it is formatted, the program falls a little short of the Mac philosophy in this segment. You have to define the width of the variable column with a series of dots; you define widths and formatting for the rest of the columns by working with a series of characters in the format window that signify what the final output will be. The process is not difficult, but neither is it intuitive or in keeping with the excellence of the rest of the package. A nice touch is that when the report appears on your screen, it is a document that you can edit directly before saving or printing.

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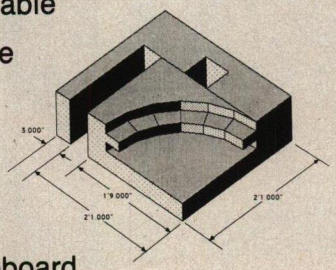

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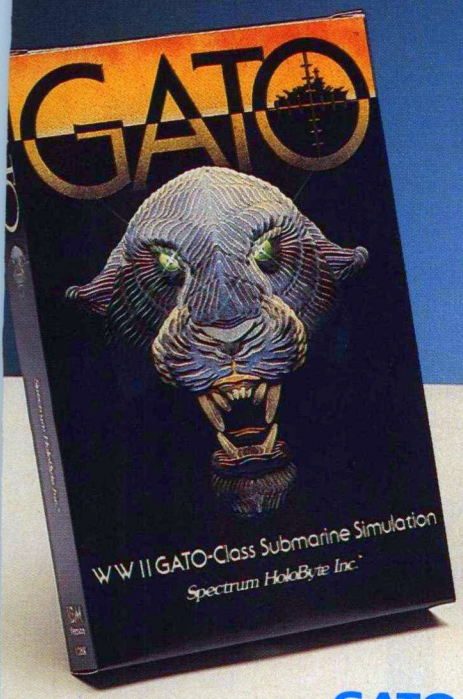

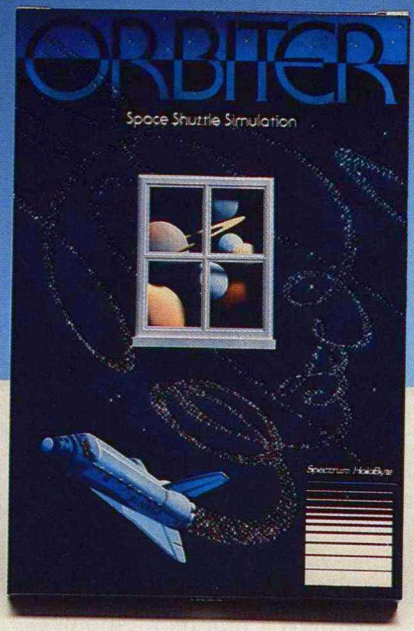

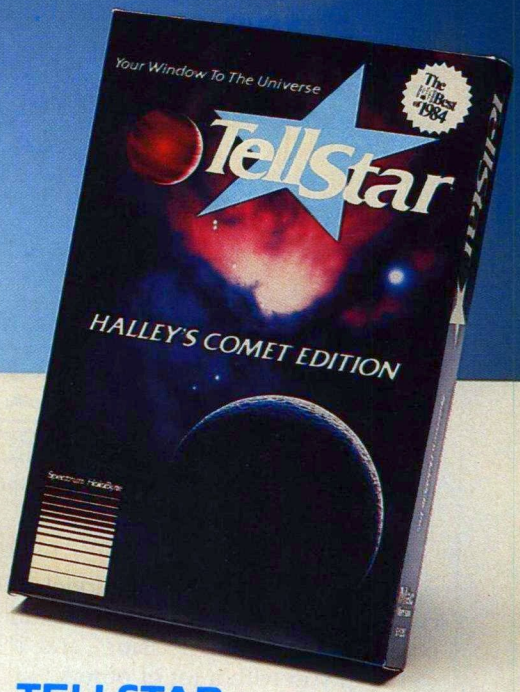

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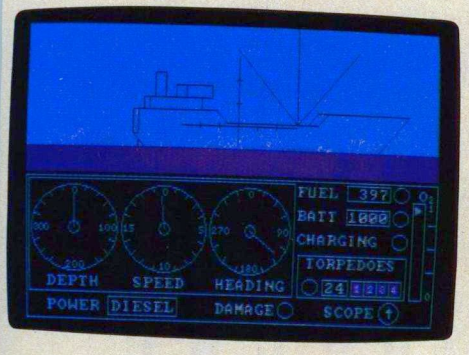

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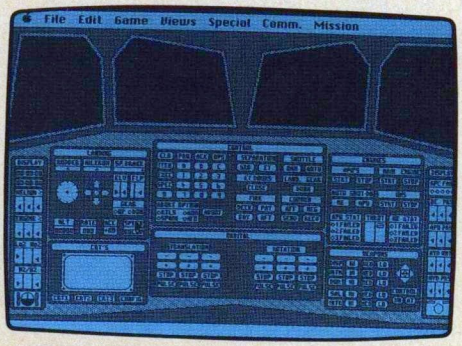

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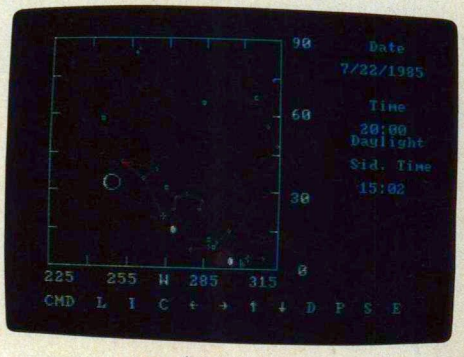

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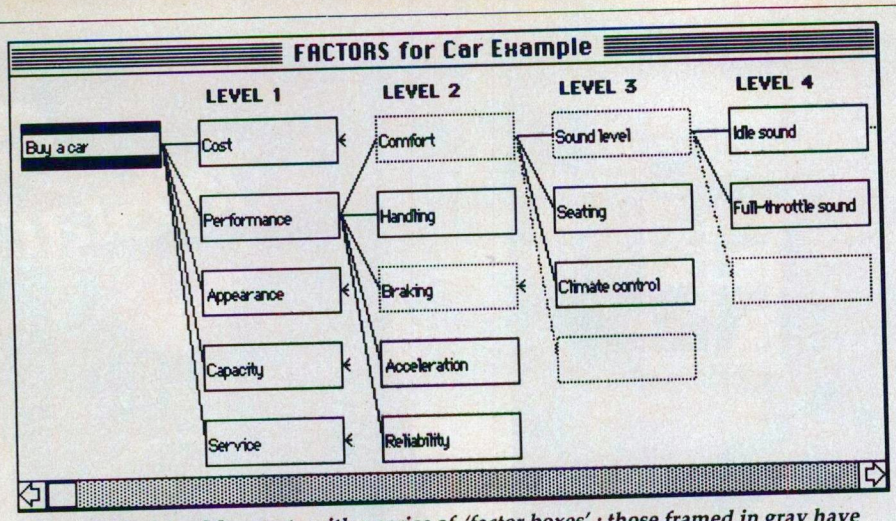

Figure 3: Decision Map starts with a series of 'factor boxes' ; those framed in gray have subfactors that have not yet been rated.

defaults. The manual is a model of clarity. Choosing MindSight should be an easy enough decision, and it can help you with a lot of others.

Decision Map

Decision Map takes an entirely different approach to the decision-making process, as it should, since it addresses a different type of problem.

Decision Map can help you make decisions while revealing the components of your own decision-making processes.

When you have a decision that involves choosing from several different, definite, alternatives, the decision factors are often qualitative, rather than quantitative. If you're choosing among several well-qualified candidates for a position in your company, for instance, you may want to consider their professional demeanor as well as their educational background and salary requirements. Or, if you're buying a new car, is a Porsche better than a Honda, considering the relative cost and image? The overall decision in either case depends on both how you rank each person or car in important categories and just how important each of those categories is to you.

Decision Map helps with these kinds of multifaceted problems. It unfortunately gets off to a poor start with a hard-to-read font in its "factor boxes" (it looks like 9-point Geneva squeezed into a monofont straitjacket) and no way to move from one box to another from the keyboard, but these annoyances are easy to overlook, considering how the rest of the program behaves.

Decision Map divides the decision-making process into two major branches: factors and alternatives. Take the time-to-buy-a-car situation. Cost, performance, appearance, capacity, and service availability may be the major factors; Porsche, Buick, and Honda may be the alternatives. You type every main factor into a box that stems from the main decision box; any factor box can have subfactors to many levels, so you get a branching network of decision factors to scroll across your screen. A click in any summary factor (a box with branches) shows its subfactors (see figure 3).

After this simple setup comes the fun. You rate the relative importance of every factor, subfactor, and sub-subfactor. The rating is neither textual nor numeric; it's graphic. All you have to do is drag bars on the screen to show each item's relative importance rating. Working with the subfactors under Cost, for instance, you might drag Purchase Price up to the top of the screen, put Operating Cost a little below that, and leave Resale Value at the bottom. The fact that you don't need to translate your instincts into numbers or words makes the operation a breeze, and likely makes it more accurate, too.

Next, you work in the Alternatives window, listing your possible choices. Then, using the same drag-the-bar method, you comparatively rank each alternative for every factor. So, the Porsche is rated high in the Cost category, Buick far below it, and the Honda even lower (see figure 4).

Now, the good part: the results. The Porsche is obviously high in price, but how did you rank cost as a factor? Is money no object, or are you on a tight budget? Decision Map combines your factor ratings (including all the subfactor ratings) with your alternative rankings and comes up with an overall rating for each alternative. Or, instead of getting an overall rating, you can call up a graph that shows the rating of a single alternative for every factor you're considering; get an outline of your factors and rankings; or use the comparison

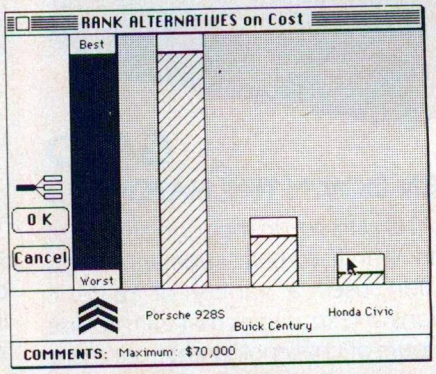

Figure 4: To rank an alternative for any factor, all you have to do is drag its bar up or down in the window.

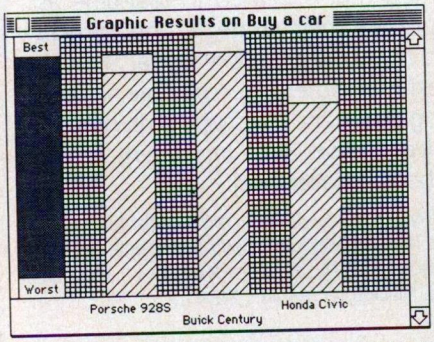

Figure 5: Decision Map's final results take into account how you ranked each alternative for every factor, as well as how you rated each factor for importance.

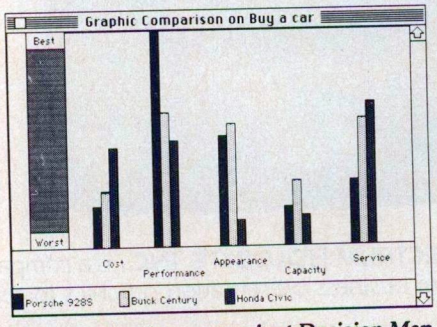

Figure 6: Another convenient Decision Map graph is the one that shows how each alternative did for every main factor.

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graph that shows every rating for every alternative. The results can be strictly in graphic form, in graphics with numeric results added to the bars, or in a text-report format (see figures 5–6).

Decision Map is a wonderful program not only for people with decisions to make, but also for people who have to back up decisions they've made on the basis of intuition, on the gut level, or by any other method inexplicable and/or unacceptable to the boss. Decision Map can help you make decisions while revealing the components of your own decision-making processes and proving or disproving their validity.

Consultant

There's more than one way to make a decision, and there's more than one way to make decision-support software. It's hard to see, however, how Consultant is any better on a computer than if it were just a notebook. It reminds me of most of the first "educational" software, which was nothing but electronic page turning, with the text transferred from the paper to the screen. I'm also a little uncomfortable with any product that touts left-brain/right-brain philosophy, and Consultant starts right off with this concept. This icon-based program has two columns of icons, each column topped by a head: One has a light bulb for the creative side of the brain, and the other labels the logical side with a pair of scales (see figure 7).

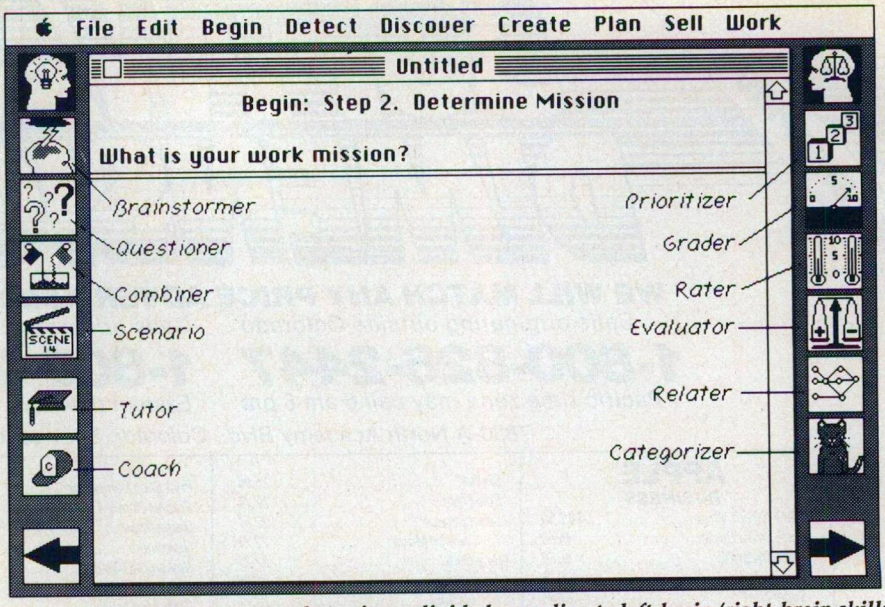

Figure 7: Consultant's screen shows icons divided according to left-brain/right-brain skills; clicking on an icon initiates the related activity.

Consultant's manual proclaims, "Questions are magical prompts for the prepared mind." Well, this software is full of questions. To skip ahead to a midprogram example: I

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clicked on the Generate Ideas icon for some help. What did I get? What ideas do you have for using your resources to overcome your obstacles and reach your objective? I didn't have any ideas; that's why I clicked on the icon in the first place.

Consultant is a well-thought-out program for training people in the decision-making process and teaching them how to list things, identify priorities, and so on. I don't mean *program* in the software sense, though; I mean *program* in the agenda sense—the material in the manual would make a wonderful weekend management or self-improvement seminar. The manual would work just as well as the software—maybe even better.

The software is just a series of questions or instructions in different categories. For instance, Gather Facts, Determine Objective, Assess Relevancy and Validity, Identify Obstacles, and Inventory Resources are the first steps in the Create procedure for creative problem solving. After you list things in one window and move to the next, the next heading appears so you can list more points.

I have absolutely no doubt of the psychological validity of these steps or any of the others in Consultant, nor do I question the practical outcome if you follow them. You don't need a computer for this process,

The material in Consultant's manual would make a wonderful weekend seminar.

though. Except for letting you assign a few rankings based on comparisons you make (similar in concept to Decision Map, but nowhere near the quality of its execution), Consultant doesn't make the computer do anything that you can't do with pencil and paper. Consultant merely guides you through the steps, with a Coach and a Tutor that offer on-line advice that is not overly helpful and is, after all, printed word for word in the manual. ✚

Sharon Aker is a free-lance journalist specializing in Macintosh applications. Her books include the recent MacPack *from Ashton-Tate and the forthcoming* Microsoft BASIC on the Mac *from Scott, Foresman.*

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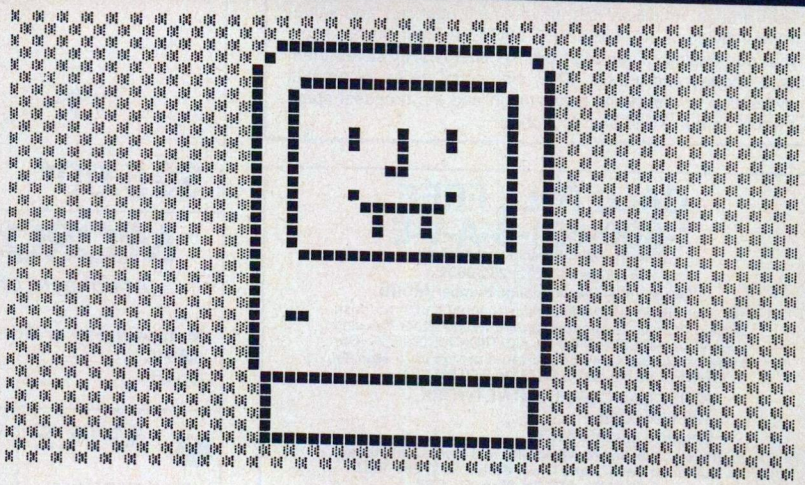

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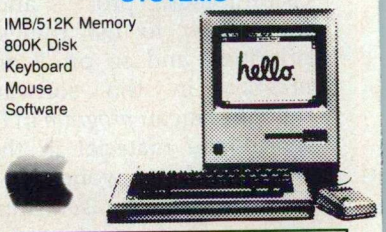

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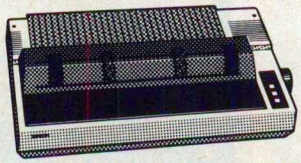

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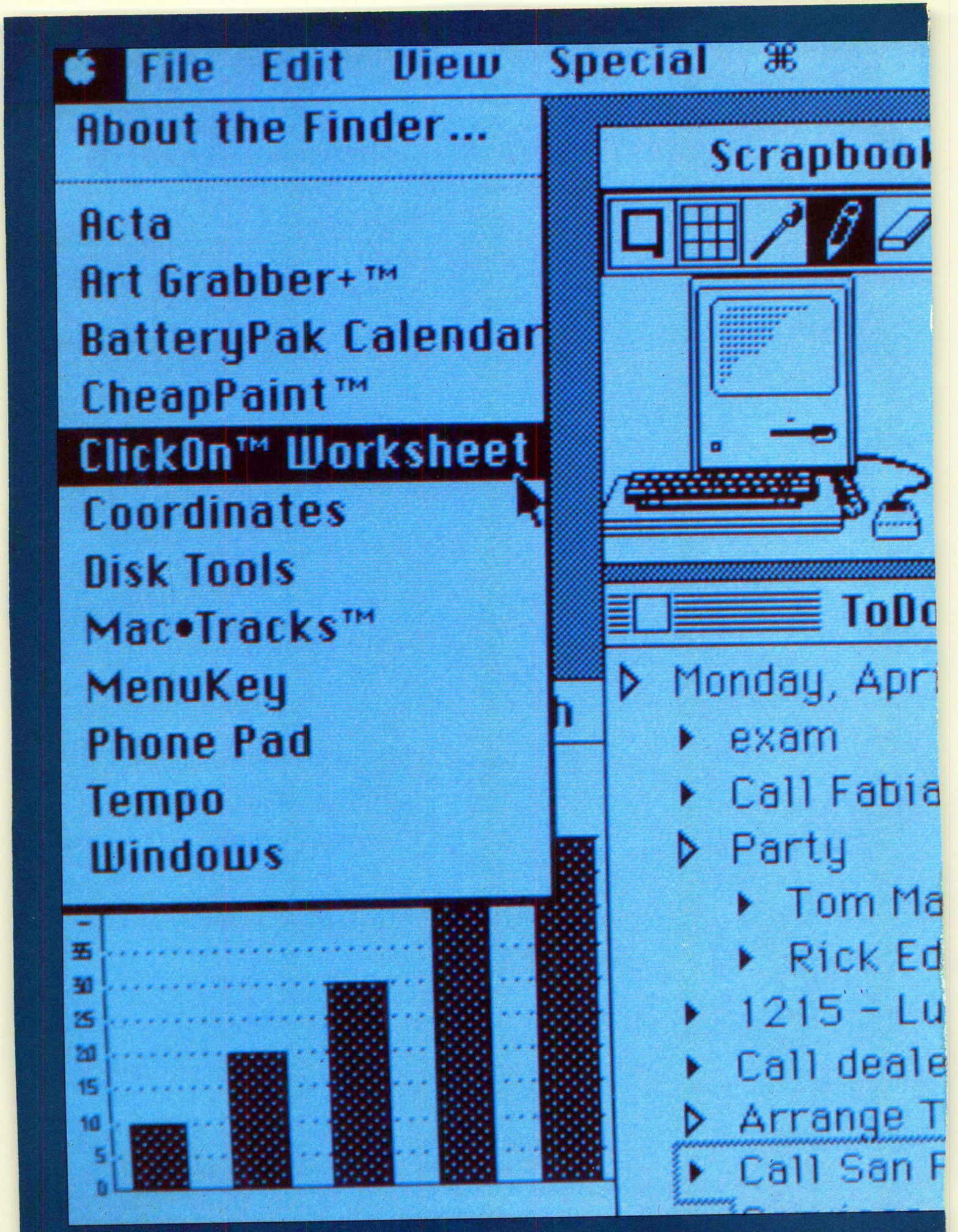
15 PRICE PROTECTION—The PC Industry is crazy!! Prices change not yearly or monthly or even weekly but often day by day! These changes are sometimes up *but are mostly down!!!* **THE NETWORK GUARANTEES THAT IN THE EVENT OF A PRODUCT PRICE REDUCTION, BETWEEN THE TIME YOU PLACE YOUR ORDER AND THE TIME THE PRODUCT SHIPS YOU WILL ONLY PAY THE LOWER AMOUNT!!**


File Edit View Special ⌘
About the Finder...
Acta
Art Grabber+™
BatteryPak Calendar
CheapPaint™
ClickOn™ Worksheet
Coordinates
Disk Tools
Mac•Tracks™
MenuKey
Phone Pad
Tempo
Windows
Scrapbook
ToDo
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exam
Call Fabia
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A look at some of the most useful desk accessories for your Macintosh

EXPANDING THE APPLE MENU

The days when Apple's standard desk accessories were the only ones available on the apple menu are long gone. Now that you can choose from hundreds of accessories, it's time to give some special recognition to some of the best in the field. So, with no further ado—the envelopes, please!

The Most Convenient Calendar Award goes to—The BatteryPak Calendar from Batteries Included. You can move quickly from one day, month, or year to another; there's plenty of room to make notes for any day; and notes for the selected day are easy to print. The calendar displays a check mark on any date that has notes attached to it. The program has a Find function that searches the entire calendar file, and you can even dial your modem by triple-clicking on any phone number stored in your notes (see figure 1).

Graphics

The Graphics Handler Award goes to M.U.D. from Hayden Software. The MacroMind Utility Disk includes Art Grabber+ and CheapPaint. Art Grabber+ lets you open a MacPaint document, no matter what program you're in, and copy a portion of the art to the Clipboard; in fact, the + in Art Grabber+ (the original was available in the Body Shop package from Hayden) is that you can now copy an entire MacPaint document if you're working with 512K or more.

This accessory is perfect for putting graphics into any document and is extremely handy in MacPaint when you need to combine elements of different documents or want a wider view than you can get from MacPaint's window. CheapPaint is a mini-MacPaint with a surprisingly complete set of tools (see figure 2); its forerunner is part of the VideoWorks package, but this accessory version has a few more options.

CheapPaint can totally replace your Scrapbook, since its "easels" are pages from the Scrapbook file. It gives you an interactive Scrapbook that lets you alter old pictures, create new ones, access Scrapbook files on other disks, and copy only portions of a Scrapbook item instead of the entire page. As long as you don't use your Scrapbook to store text that has to be retrieved as text—editable in MacWrite, for instance—CheapPaint can knock the Scrapbook right off the apple menu.

Numbers

The Best Calculator Award belongs to one that you create yourself with the Calculator Construction Set from Dubl-Click Software (see figure 3). You start with a calculator shell of any size, add keys of different shapes, and "wire" them to act as numeric or function keys. You can set up multiple readouts (one for decimal and one for hexadecimal, for instance) and add a "paper tape." It has an amazing variety of special mathematical and financial functions, and you can add programmable and macro keys. Even the finer points are here: You can also add a calendar or a clock; pick a pattern for the calculator case; and even design a cursor that will appear whenever you use your calculator. The manual falls short in clarity, but the software is fantastic. Dubl-Click Software's attitude is also to be commended: The company encourages you to create calculators with the Construction Set and place them in the public domain.

Macros

The Heavy-Duty Macro-Editor Award is obvious: Tempo from Affinity. Tempo is "heavy-duty" in more ways than one: It has a lot of power, but it also takes a lot of space. Don't even think about it unless you have a hard disk. On its easiest level, Tempo records mouse moves so you can use a ⌘-key sequence to perform multiple operations; the basic sequence includes the Command key and an alphanumeric key but can also include Option, Shift, and/or Caps Lock. Tempo can also "branch": It can check a value placed on the Clipboard, and, based on that value, take some action that you have defined. That action may be to end the macro, reuse it, or go on to another one.

Another special Tempo ability is in launching programs from the desktop. A simple mouse recording can't work there unless the application icons are always in the same spot, but Tempo gets around that problem. Pauses can be part of a macro, so, for instance, you can set up a macro to pull out the Scrapbook, copy a page, and paste it into your Word document. You can control the pause so you have time to click to the page you want. A pause can be for a preset length of time or wait for user entry and can be accompanied by a dialog box containing any message you want (see figure 4). Tempo also has the interestingly named feature Immortality. Because it "lives" from one application to another, you can set up a Tempo macro to move information

PACIFIC HORIZONS PHOTOGRAPHY

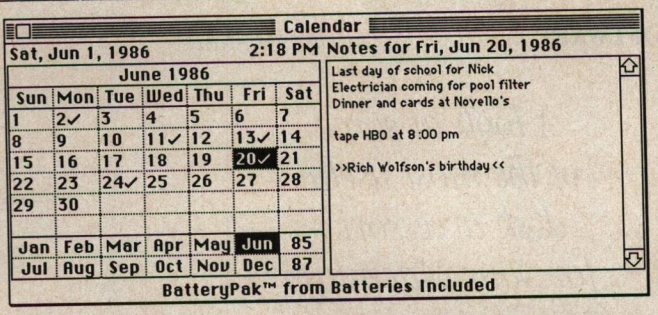

Figure 1: The BatteryPak Calendar wins the Most Convenient Calendar Award. You can move quickly from one day, month, or year to another; there's plenty of room for notes; and the calendar displays a check mark for any day that has notes attached to it.

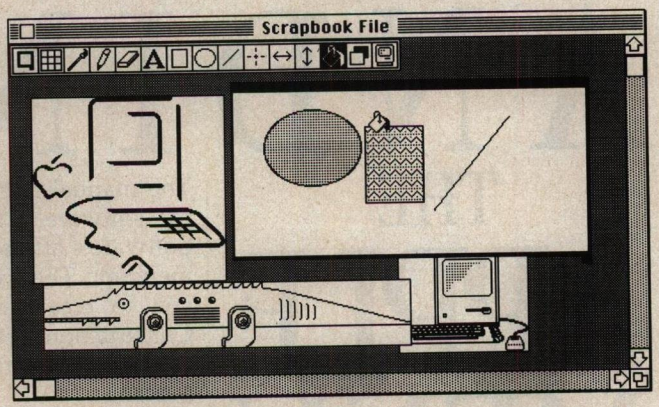

Figure 2: CheapPaint accesses the Scrapbook file, putting a page in each of its 'easels.' In addition to the MacPaint-like tools that appear in the window, it has a Font/Style menu and a window that lets you change patterns, line thicknesses, and brush shapes.

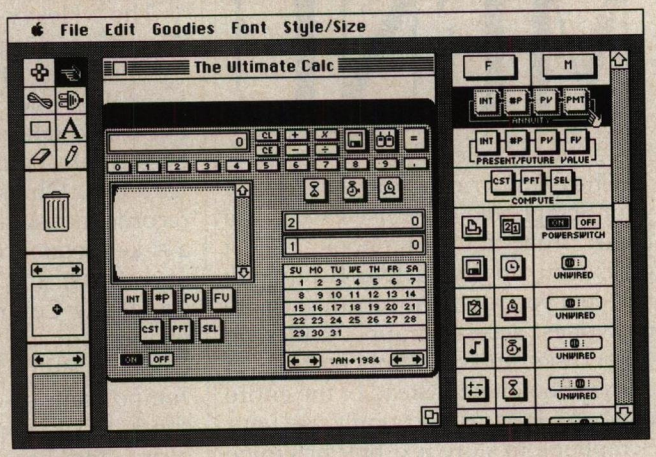

Figure 3: A calculator under construction in Dubl-Click's construction set, which wins the Best Calculator Award. You start with a calculator shell of any size, add keys of different shapes, and 'wire' them to act as numeric or function keys. The Construction Set has an amazing variety of mathematical and financial functions.

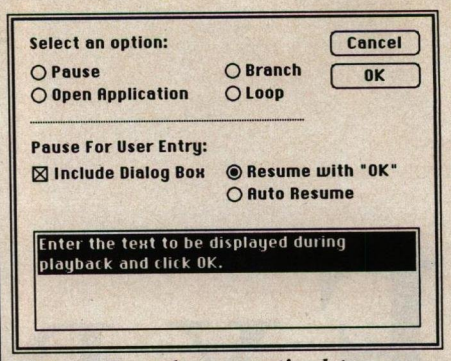

Figure 4: Tempo's pause option lets you pause for a timed interval or for user entry.

from one program to another and manipulate it.

If you want to get picky, Tempo isn't really a desk accessory from a programming point of view, but it lives on the apple menu—taking up two desk-accessory "slots"—so it's eligible for an award.

More Macros

The Macro Editor for the Rest of Us Award is for Mac-Tracks from Assimilation. Mac-Tracks records your mouse moves and keystrokes; each recording gets a ⌘-key identification and can be played back with the assigned sequence. Since you can also use the Shift and Option keys (separately or together), you have plenty of room to store commands. A simple ⌘-key sequence can play back a routine like this one in Word: select the entire document, change it to double-space, indent the paragraphs, select the Boston font, move footnotes to the end of the document, turn on automatic pagination, change the paper margins, and print at high quality. Or you can just set up ⌘-1 for high-quality printing and ⌘-2 for standard. Since the program also records keystrokes, you can put your name and address on a single key or store paragraphs for form letters.

The Mac-Tracks Library command brings up a listing of all your macros so you can review or edit them; you can sort them by the assigned keys or by the name you gave them when you created them. A new version of MacTracks was in the works as I wrote this; it will have a few more features, but the original version already deserves the award.

Programming

The Programmers' Helper Award goes to Coordinates from Accessory-Pak 1. It prints out the current mouse coordinates in the corner of the menu bar. Since you can reset the 0,0 orientation, it is a boon for designing windows, buttons, edit fields, and graphics.

Spreadsheet Plus

The I Can't Believe It's a Desk Accessory Award goes to T-Maker's ClickOn Worksheet, a spreadsheet-with-graphics application (see figure 5). Worksheet is a spreadsheet of 20 by 50 cells with more built-in mathematical functions than Multiplan, most of them geared to financial calculations (such as compounded yields, annuity figures, and mortgage calculations).

Worksheet's "folding" capability allows you to collapse columns of figures into temporary oblivion. Once the sheet is folded, you can select and chart only the figures that show. For graphics, you can choose from bar, stacked bar, line, and pie charts; you can add labels, titles, and legends to any chart. You can pull Worksheet out to do figures and charts for immediate pasting into a word-processing document, or you might even want to install it on your Multiplan disk so you can use the graphics features.

MacPaint Special Effects

The Fun with MacPaint Award belongs to ClickArt Effects from T-Maker, which adds four new capabilities to MacPaint: rotation in as little as one-degree increments, slanting, perspective, and distortion (see figure 6). Although ClickArt Effects appears on the apple menu, it is actually installed into MacPaint and thus appears only when you run that program.

When you select Effects from the menu, MacPaint's tools and palette disappear, leaving you with four new icons representing the special effects you now have at your disposal. To use any of the effects, you click on the icon, enclose a portion of your picture in a selection rectangle, and use the mouse cursor to alter the rectangle.

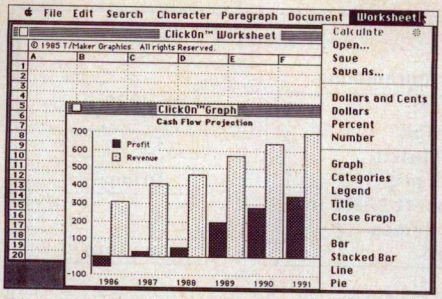

Figure 5: Click-On Worksheet, here shown appended to Word's menu, gives you a spreadsheet and graphics application on your apple menu.

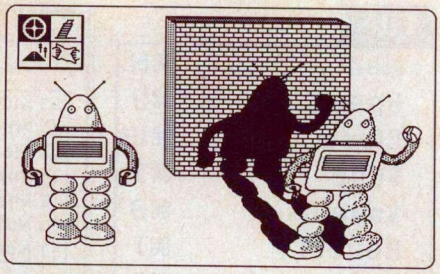

Figure 6: The four new capabilities MacPaint gains with ClickArt Effects, whose icons are shown in the corner, were applied to the old Scrapbook robot with some interesting results.

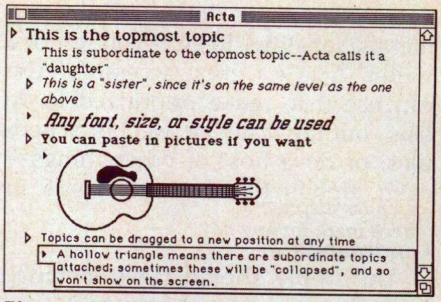

Figure 7: The Acta outliner accessory, which easily wins the Writers' Best Friend Award, is versatile and easy to use and has a lot of special features.

Since you can use different effects on the same part of the picture (in any sequence, but not simultaneously), the possibilities are endless. Just the small pleasure of standard shapes in new orientations (slanted ovals and rectangles, diamonds from rotated squares) is enough to keep your first "special-effects" MacPaint session going.

Outlines

The Writers' Best Friend Award easily goes to the Acta, new from Symmetry Corporation (see figure 7). Acta is a simple-to-use outliner with a lot of special features. With an outliner, you type lines (or, in Acta's case, even paragraphs) of text on different "levels," some subordinate to others. At a click of the mouse button, you can make subordinate levels disappear and view only your major categories. A "topic" can be dragged to a new position with the mouse, so it's easy to rearrange your outline. The program can sort topics numerically or alphabetically, in ascending or descending order.

You can use different fonts and styles in any spot and even paste pictures into an Acta outline. Acta lets you save outlines in three formats: Acta only, word processing, or text only. You can save with the topics "bare," with bullets as the leader character, or with numeric or Harvard

SPACE FOR YOUR DESK ACCESSORIES

Just how many desk accessories can you squeeze into your apple menu? There are 16 "slots" for desk accessories, so that's the maximum number you'll be able to use, but, unless you're working with a hard-disk drive, other space considerations will prevent you from filling up the menu.

Some desk accessories come with their own installers, but you transfer most of them to your System with the Font/DA Mover. Either way, they quickly add to the size of your System file. If you're working with floppies, especially single-sided ones, you can't afford to give up so much disk space just to desk accessories.

In addition to taking up space themselves (see the Desk Accessories Chart), many accessories create data files that also use space on the disk. In some cases, these are single, dedicated files that hold all the information you have stored in the desk accessory. Usually the dedicated file has the same name as the accessory, and it is the only one that you can access. These dedicated files must also be on your system disk, cr, in the case of the Hard Disk 20, in the System folder, in order to be used. The size of the dedicated file depends on how much information you store in it.

Some accessories let you create and access multiple files; in such a case, the file does not have to be on the default disk, so you don't have to worry so much about the room it needs. It's important to note that the usefulness of an accessory such as a calendar that keeps track of a lot of information is severely restricted on a floppy-drive system; unless the same Calendar file is always accessible, you'll have different information stored on different disks.

DESK ACCESSORIES CHART

Desk Accessory	Size	Files	Comments	From...
Acta	35K	🗋🗋		Symmetry Corporation
Art Grabber+	4K		Accesses any MacPaint document	M.U.D. (MacroMind Utility Disk) Hayden Software
BatteryPak Calendar	14K	🗋		The BatteryPak Batteries Included
Calculator [Construction Set]	@4K		Size depends on calculator design	Calculator Construction Set Dubl-Click Software
CheapPaint	27K	🗋	Accesses Scrapbook file from any disk	M.U.D. Hayden Software
ClickArt Effects	*		Installs in MacPaint, not in System File	T/Maker Graphics
ClickOn Worksheet	35K	🗋🗋		T/Maker Graphics
Coordinates	3K			AccessoryPak 1 Silicon Beach Software
Mac•Tracks	1K	🗋		Assimilation
MenuKey	3K			TopDesk Cortland Computer
Tempo	65K	🗋	Takes 2 "slots" in the Apple menu	Affinity
The BatteryPak: DiskTools	9K			Batteries Included
The BatteryPak: Launcher	3K			
The BatteryPak: Phone Pad	9K	🗋		
The BatteryPak: Print Text	5K		Accesses any text file	
The BatteryPak: RPN Calculator	7K			
The BatteryPak: Scientific Calc.	11K			
The BatteryPak: Windows	1K			

Key: 🗋 *creates a dedicated file* 🗋🗋 *creates multiple files (see sidebar)*

(Roman numerals/letters/Arabic numerals) labeling. Even if you're not a writer, Acta's a great accessory. You can use it to make prioritized to-do lists, outline daily or weekly schedules, or do a host of other things—even alphabetize lists of words or names.

Commands

The Apple Should Have Included It as Standard Award goes to MenuKey, one of the items in Cortland Computer's TopDesk. MenuKey lets you create, change, or delete the ⌘-key options in almost any application menu (see figure 8). You can make the changes temporary or permanent, although some menus—such as the apple menu and font menus—can be altered only temporarily. Changing the menus with MenuKey is more efficient than using a "recorder" such as Mac-Tracks or Tempo for a single menu selection. Recorders play back the moves, pulling down the menu, dragging the mouse, and so on. MenuKey changes the application itself so that the ⌘-key sequence replaces the menu selection; and, you have the added benefit of the ⌘-key option showing in the menu.

Grand Prize

And now, the award you've all been waiting for . . . The Best Desk-Accessory-Package Award goes to BatteryPak from Batteries Included—the hands-down winner. Its Calendar is described above, since it received its own award. The Phone Pad is the last item I'd ever give up from my own apple menu; it's a 250-page Note Pad with a Find option that turns it into a free-form database. It uses 9-point Geneva as its font, so you can fit a lot on a page, and you can dial your modem with a triple-click on a phone number. DiskTools lets you delete, copy, and rename files from within an application (see figure 9). Launcher lets you go from one application to another without going to the desktop; unlike with Switcher and the MiniFinder, you don't have to set up in advance. Windows adds a menu whose items are all the windows open in your application or on the desktop—handy in Word, a lifesaver on the Hard Disk 20 desktop.

BatteryPak has two new calculators, each of which uses Reverse Polish Notation, which Hewlett-Packard calculators popularized; one is a smaller version of the other, for those who don't need to notate in reverse quite as much. The Print Text accessory is a print spooler—you can print any available text file and still use your Mac while the printing is taking place. In addition to the terrific accessories, BatteryPak includes two utilities that let you print and archive the information in your Phone Pad and Calendar.

Your own choice of desk accessories will depend on your particular needs and the size of your system. ✚

Sharon Zardetto Aker has recently completed a book about Microsoft Works, which will be published by COMPUTE! Books.

Figure 8: With MenuKey, MacPaint's File menu can look like this.

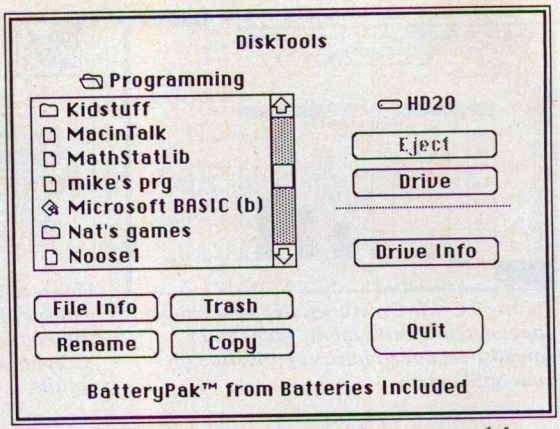

Figure 9: DiskTools is only one of the many useful accessories in BatteryPak, hands-down winner of the Best Desk-Accessory-Package Award.

PRODUCT INFORMATION

Accessory Pak 1
Silicon Beach Software
P.O. Box 261430
San Diego, CA 92126
(619) 695-6956
List Price: $39.95 plus $2 shipping
Requires: Macintosh

Acta
Symmetry Corporation
761 East University Drive, Suite C
Mesa, AZ 85203
(602) 844-2199
List Price: $59.95
Requires: Macintosh

BatteryPak
Batteries Included
17875 Skypark North, Suite P
Irvine, CA
(714) 250-8723
List Price: $49.95
Requires: Macintosh

Calculator Construction Set
Dubl-Click Software
18201 Gresham Street
Northridge, CA 91325
(818) 349-2758
List Price: $99
Requires: Macintosh

ClickArt Effects and **ClickOn Worksheet**
T/Maker Graphics
2115 Landings Drive
Mountain View, CA 94043
(415) 962-0195
List Price: ClickArt Effects, $49.95; ClickOn Worksheet, $79.95
Requires: Macintosh

Mac-Tracks
Assimilation, Inc.
485 Alberto Way
Los Gatos, CA 95030
(408) 395-7679
List Price: $29
Requires: Macintosh

MacroMind Utility Disk (M.U.D.)
Hayden Software Company, Inc.
650 Suffolk Street
Lowell, MA 01854
(617) 937-0200
List Price: $49.95
Requires: Macintosh (Art Grabber+ requires 512K RAM)

Tempo
Affinity Microsystems Ltd.
1050 Walnut Street, Suite 425
Boulder, CO 80302
(303) 442-4840
List Price: $99
Requires: Macintosh

TopDesk
Cortland Computer, Inc.
P.O. Box 9916
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You'll have a bigger AppleWorks desktop, but you'll still be limited to a maximum of 1350 records in the data base. And you're stuck at 2250 lines in the word processor. And AppleWorks won't automatically load itself into memory, and make sure you don't create a file bigger than your disks can hold because neither FLIPSTER nor Apple's memory card will segment a file onto multiple disks.

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Maximum Number of Lines in Word Processor	15,300	2250
Autoloads AppleWorks	YES	NO
Auto Segments Files	YES	NO
Built-in Printer Buffer	YES	NO
Compatible With All Versions of AppleWorks	YES	NO
Displays Time & Date on AppleWorks Screen with Clock	YES	NO
Saves Slots	YES	NO
RGB Option	YES	NO
16 Bit Co-Processor Port	YES	NO
Memory Expansion Ports	YES	NO
Patent Pending Power-Saving Circuit	YES	NO
80 Columns Built-in	YES	NO
Maximum Memory per Slot	5120 K	1024 K
Compatible with Franklin 2000 Software	YES	NO
Compatible with Auxiliary Slot	YES	NO
Software Standard	YES	YES
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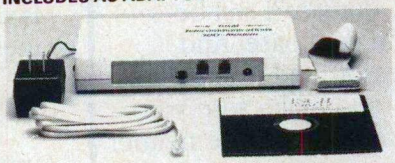

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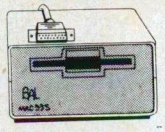

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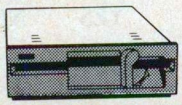

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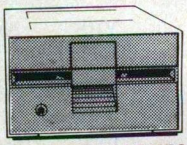

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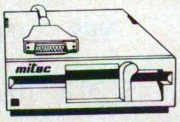

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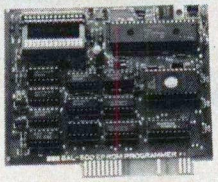

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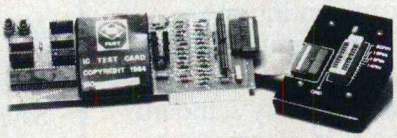

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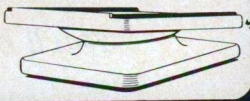

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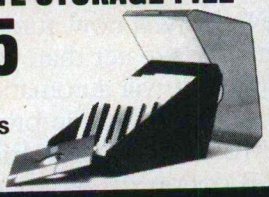

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PICTURE AIDE

A program that helps you put graphics into your BASIC programs

If you're a BASIC programmer, you've probably wished you could easily put graphics into your programs. Until recently, doing so was a laborious and often frustrating process. The following program, PictureAide, is designed to help you put graphics into your programs painlessly.

This article refers to two companion programs to PictureAide, PatternAide and ICON-Aide, which are not included here because of space limitations. You can find them on CompuServe in the MAUG Macintosh special-interest group in Data Library 3, under the name Aide.Pit (sample data is called PATN.PIT, ICON.PIT, and PICT.PIT). You can pack and unpack these programs with PACKIT .BIN in Data Library 8. You can also find the programs on GEnie in the Macintosh Round Table under the same names. If you do not have access to CompuServe or GEnie, you can remove references to the companion programs from the PictureAide program, as shown in figure 1.

The PictureAide program is a tool that assists you in moving images from MacPaint, MacDraw, Microsoft Chart, or any other graphics program that uses the Clipboard to get into a BASIC program.

Pictures are graphic images stored as a string of text characters. These characters can direct Microsoft BASIC's PICTURE command to recall the proper ROM subroutines for redrawing a graphic image. For BASIC programming, storing pictures in the PICTURE command format, instead of having your program draw directly with LINE or other graphic commands, can save you a large amount of memory. PictureAide makes it easy for you to save pictures in a way that makes them simple to use in any BASIC program.

The PictureAide program provides you with two ways to save your pictures. First you can save them simply as PictureFiles, which contain the character strings to redraw the image in a BASIC program. The other option is to save images as BitMaps. BitMaps are records of a rectangular area that you can draw to the screen with the BASIC PUT statement.

The PictureAide program requires Microsoft BASIC and runs on either a 128K or 512K Macintosh. It is possible to try to open a picture that requires too much memory to load into PictureAide on a 128K Mac, but it's not very likely.

You can create the application in any program that can save graphics to the Scrapbook. You'll probably create most pictures with MacPaint, but you may find MacDraw, Microsoft Chart, or some other program best for designing a specific picture. When you have the picture the way you want it, use Cut or Copy to get the picture onto the Clipboard. If you are creating only one picture, you can now move back to BASIC and run PictureAide.

If you want to create more than one picture at a time, you can save them in the Scrapbook. If you're using a 128K Macintosh, you most likely won't be able to view pictures on the Scrapbook when you are in BASIC. Make a note of the Scrapbook page numbers for your pictures so you can keep them straight.

Change:
```
MENU 3,2,1,"32 by 32 BitMap (ICON)"
MENU 3,3,1,"8 by 8 BitMap (PATN)"
```
To read:
```
MENU 3,2,1,"32 by 32 Fixed BitMap"
```

Figure 1: You should make this change to the PictureAide program if you don't have access to PatternAide and ICON-Aide.

If you are going to use pictures from the Scrapbook, you'll have to move the Scrapbook from the disk containing the application that creates the graphics onto the BASIC disk. Your BASIC disk will almost certainly already have a Scrapbook file. To save the existing BASIC Scrapbook, change its name to something other than Scrapbook File before copying the Scrapbook file from the graphics disk to the BASIC disk. Now you can run the PictureAide program.

The PictureAide program provides you with two ways to save your pictures.

Viewing the Clipboard

If you've used the Scrapbook to store pictures, the first thing to do is get your picture onto the Clipboard. To do so, open the Scrapbook and move to the page where the picture is stored. Then select Copy or Cut from the Edit menu. The picture should now be on the Clipboard. To be sure that you have got the picture you want, select View Clipboard from the File menu before saving the picture. The View Clipboard option opens another window that will display the Clipboard's contents. You can view the Clipboard even when another picture is displayed in the main window.

When you have a picture you want to save ready in the Clipboard, use the Clipboard –> PictureFile option from the File menu to save your picture. The standard file window will appear and give you an opportunity to save your picture in a file. When you save your picture, be sure to add .PICT to the end of the filename, because it helps you identify this file as a PictureFile for later use in your programs.

Viewing a Saved PictureFile

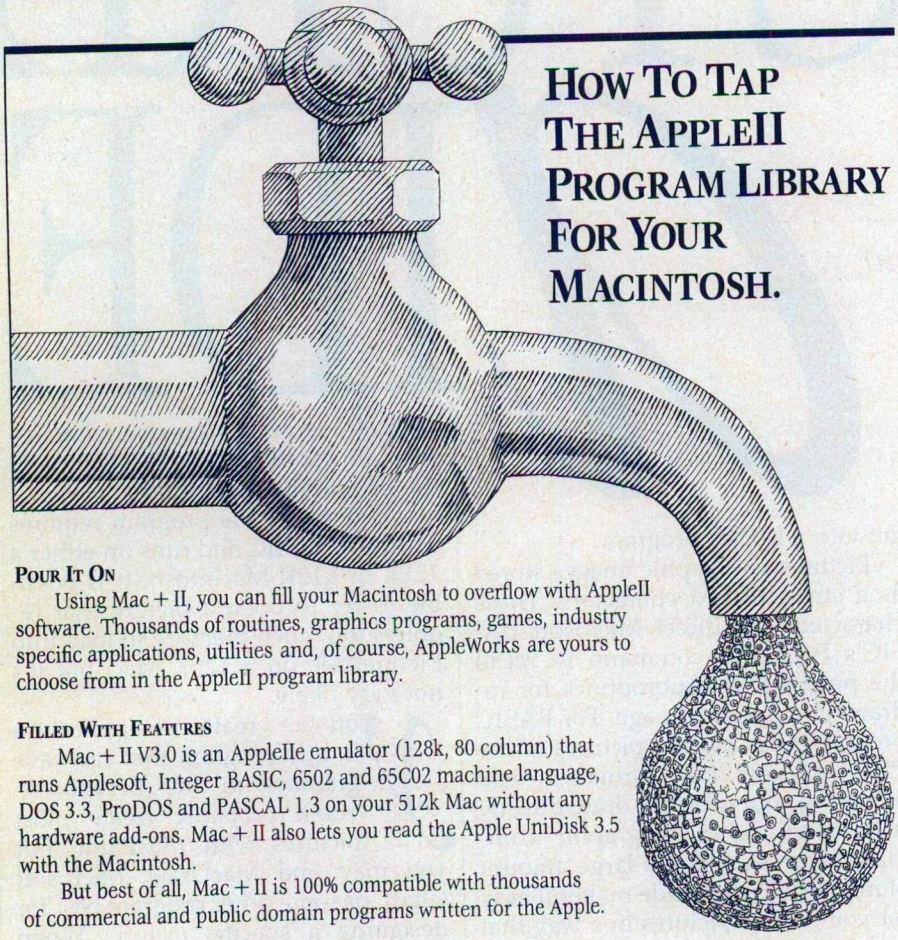
You can see a picture that has been saved on disk by selecting Open PictureFile from the File menu, which calls up the standard file-open window. Be sure you select a PictureFile, or you might run into problems. The .PICT ending on your PictureFiles comes in handy for identification. Selecting Close PictureFile clears the screen.

You may want to put a picture back into the Clipboard for transfer to the Scrapbook or an application program. You can, for example, send a picture back to MacPaint for editing. Select the PictureFile –> Clipboard option in the File menu and select the picture you want to send to the Clipboard. Once a picture is in the Clipboard, you can open the Scrapbook and select Paste from the Edit menu to save the picture in the Scrapbook.

PictureAide also lets you save part or all of a picture in the BitMap format. The BitMap format is a series of integers that you can use with the BASIC PUT statement to recreate the graphic image. BitMaps are especially good for high-speed animation or for use with some of the ROM drawing routines. PictureAide gives you three kinds of BitMaps: flexible BitMaps, 8 × 8 BitMaps, and 32 × 32 BitMaps.

Flexible BitMaps

To create a flexible BitMap, select Flexible BitMap from the BitMap menu. Move the cursor to the upper left corner of the area you want to



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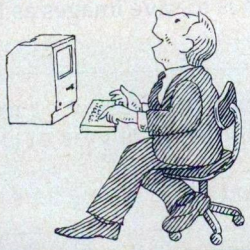

Mac + II V1.0 ($99.95) requires min. 128k Mac and does not run ProDOS or have graphic memory screen. Mac + II V3.0 ($149.95) requires 512k Mac. Mac + II V3.0 will also emulate an AppleII + or an AppleIIe enhanced. **New For AppleII Owners:** Meacom now offers UniDOS™ ($25.00) which is DOS 3.3 for the UniDisk 3.5. Apple, Macintosh, AppleWorks, UniDisk 3.5, ImageWriter and ProDOS are trademarks of Apple Computer, Inc. UniDOS is a trademark of Meacom.

CIRCLE 170 ON READER SERVICE CARD

capture. Now press and hold the mouse button down while you move to the lower right of the area you want to capture. The area you select inverts (pixels that were black appear as white, and vice versa). A display at the upper right of the window shows the dimensions of the selected area and the size of the integer array necessary to handle a BitMap of that size. As long as the array size is 1000 or less, the Capture button, which appears below the array information, will be active. Clicking on this button brings up the File menu, so you can save the BitMap. Flexible BitMaps are stored in a "raw" form. You'll have to write your program to allocate the proper amount of space to the needed array.

PictureAide also lets you save part or all of a picture in the BitMap format.

THE PICTUREAIDE PROGRAM

```
>>> PictureAide <<<
The Microsoft BASIC Picture handler
©1985 by CSI Design Group

DIM BitMap%(1000), rect%(4),ICON%(101)
pic$=""
BFlag=0
rect%(0)=0:rect%(1)=0:rect%(2)=0:rect%(3)=0
FOR a=0 TO 65
  READ ICON%(a)
NEXT a
WINDOW 1,"Picture Aide",(10,40)-(502,340),1
MENU 1,0,1,"File"
MENU 3,0,1,"BitMap"
MENU 4,0,1,"Options"
MENU 5,0,0,""
MENU 1,1,1,"About PictureAide"
MENU 1,2,0,"-"
MENU 1,3,1,"Open PictureFile"
MENU 1,4,1,"Close PictureFile"
MENU 1,5,1,"Save PictureFile"
MENU 1,6,0,"-"
MENU 1,7,1,"View Clipboard"
MENU 1,8,1,"Clipboard -> PictureFile"
MENU 1,9,1,"PictureFile -> Clipboard"
MENU 1,10,0,"-"
MENU 1,11,1,"Quit"
MENU 3,1,1,"Flexible BitMap"
MENU 3,2,1,"32x32 BitMap (ICON)"
MENU 3,3,1,"8x8 BitMap (PATN)"
MENU 3,4,2,"BitMap Recording Off"
MENU 4,1,1,"Run Another Program"
MENU 4,2,1,"Quit to Finder"

startup:
  choice=0:h=0
  WHILE choice=0
    GOSUB menuhandle
  WEND

menuhandle:
  n=MENU(0)
  s=MENU(1)
  ON n GOTO fileMenu, , BitMenu, optionMenu
  IF MOUSE(0) AND BFlag=1 THEN RecordBitMap
  IF MOUSE(0) AND BFlag>1 THEN SetFrame
  IF DIALOG(0)=1 THEN CaptureBitMap
RETURN

fileMenu:
  ON s GOTO AboutWindow,, OpenPic, ClosePic, SavePic,, ViewClip, SaveClip, ClipPic,,

BitMenu:
  ON s GOTO BitMapOn, ICONOn, PatternOn, BitMapOff

optionMenu:
  ON s GOTO bootprogram, endtosystem

OpenPic:
  a$=FILES$(1,"PICT")
  IF a$="" THEN RETURN
  CLS
  OPEN a$ FOR INPUT AS #1
  pic$=INPUT$(LOF(1),1)
  CLOSE #1
  pn$=a$
  PICTURE ,pic$
  MENU 1,0,1
  RETURN

ClosePic:
  CLS
  MENU 1,0,1
  pic$=""
  RETURN

SavePic:
  a$=FILES$(0, "Save the Picture as:" )
  PICTURE ,pic$
  IF a$="" THEN RETURN
  OPEN a$ FOR OUTPUT AS#1
  PRINT #1,pic$
  CLOSE #1
  NAME a$ AS a$,"PICT"
  pn$=a$
```

8 × 8 BitMaps

The 8 × 8 BitMap option from the BitMap menu gives you a fixed frame in which to capture an 8 × 8-pixel BitMap. Pressing the mouse button moves the upper right corner of the selected area to the mouse location. As with a flexible BitMap, you indicate the selected area by inverting it. Holding the mouse button down, you can drag the selected area until you line it up in the spot you want. Then release the mouse button and click on the Capture button in the upper right of the main window. The 8 × 8 BitMaps are saved in the PATN format used by the PatternAide program. When you're saving an 8 × 8 BitMap, be sure to attach the .PATN ending to the filename. Using the 8 × 8 BitMap is a good way to bring patterns from MacPaint to BASIC. Select an area in a picture that contains a pattern you'd like to use in your programs, load it into PictureAide, use the 8 × 8 BitMap to capture it, and then use PatternAide to put the pattern into the DATA format.

32 × 32 BitMaps

PictureAide provides for another fixed-size BitMap, of 32 × 32 pixels. You select the graphic area for this type of BitMap in the same way as you do the 8 × 8 BitMap. A 32 × 32 BitMap is stored in the format used by the ICON-Aide program and can be loaded directly into ICON-Aide. When you save a 32 × 32 BitMap, be sure to add the .ICON ending to your filename.

Selecting BitMap Recording Off removes the Capture button from the window and stops selection of BitMaps.

The Options menu gives you shortcuts to common operations that otherwise would require quitting the program and typing commands. The Run Another Program option brings up a file-selection window that lists only BASIC programs stored in the default (compressed) format. Selecting Quit to Finder sends you directly back to the Finder (or miniFinder). ✚

Mark Sumner is director of product development for CSI Design Group, a small St. Louis company that develops educational and entertainment software. A big fan of using BASIC to produce prototypes of programs before release, he developed PictureAide as one of a series of utilities to bring more ease and power into BASIC.

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MacTips

Suggestions from our readers

POWER-USER SHORTCUTS

The Macintosh user interface has been designed to provide ease of use to a wide range of users with many different levels of experience. For "power users," there are many built-in shortcuts and additions that customize the way the Macintosh deals with your files. (The following keyboard and mouse shortcuts work with Finder 4.1.)

Windowing: By holding down the ⌘ key, you can select and drag a window on the desktop or in an application without having the window become active. This technique lets you move a window while keeping it behind the frontmost active window.

Clean Up: By holding down the Option key while selecting Clean Up in the Special menu, you can make all of the icons in the current window realign automatically.

Trash: Normally when you drag an application into the Trash, the Finder prompts you with Are you sure you want to remove the application (name of application)? Holding the Option key down while selecting and dragging the files into the Trash, however, suppresses this dialogue and allows you to trash application files even if they're locked.

Quit MiniFinder: With the MiniFinder active and installed, holding down the Option key while quitting an application returns you to the regular Finder rather than the MiniFinder.

Quit MacPaint: Holding down the ⌘ key when quitting MacPaint allows you to exit from MacPaint and then reboot the Macintosh.

Enter MiniFinder: Pressing the Enter key while you're in the MiniFinder is equivalent to selecting the Finder button with the Mouse: It returns you to the Finder.

Dan Allen
Cupertino, CA

CLONE MESSAGES

Inside the Macintosh ROM, at address $40AD26 (4238630 in decimal) resides a routine that, when called, paints a message in the upper left corner of the screen. (It was put in there to identify illegal copies of the ROM chip.) To see the message, you can use any of several programming languages, debuggers, or assemblers: For example, in BASIC:

```
A! =4238630
CALL A!
```

Tom Neudecker
Pittsburgh, PA

REMOVING LABELS

As a charter subscriber, I know that I have never read this hint, so I want to let all your readers know what I have discovered that saves a lot of aggravation and a little bit of money. There is a trick to removing address labels from a printer without having them stick to the printer and without having to waste any of them. First, make sure that the pressure (friction) is turned off. Then slip a piece of paper between the printer and the labels and pull the labels out of the back of the printer. If the labels have a tendency to stick to anything, it will be to the paper, not to the printer. After spending quite a bit of time picking out stuck labels with tweezers, I knew there had to be another solution!

Merry Perry
Baltimore, MD

FONT/DA MOVER SECRETS

If you're like most Macintosh users, you probably have some desk accessories or fonts that are useful in certain applications but go unused in the majority of your work. Wouldn't it be nice if you could easily install these fonts or desk accessories directly in the applications where they were most useful, so they wouldn't take up space in the System file? You can.

Using the Option key in conjunction with other commands releases some little-known abilities in Apple's Font/DA Mover utility. Pressing the Option key while you click on the Open button, for instance, lets you open applications rather than System, Font, or DA files. Using this technique, you can install the Rulers desk accessory (from Silicon Beach's Accessory Pak #1) directly into MacPaint. Since Rulers works only in MacPaint, there's no reason to have it in your System file. This also frees up a space in your System file for more fonts or desk accessories.

The Option key unleashes some other hidden powers of the Font/DA Mover as well. For example, the Font/DA Mover automatically opens the fonts in a System file when you start the program, but if you hold down the Option key while launching the program, it will open desk accessories instead. The Option-key functions are listed in figure 1.

David Simerly
Mountain View, CA

Key Sequence	Result
Option at Launch	Opens DAs instead of fonts
Option + Select DA	Shows data elements of the DA
Option + Open	Opens applications
Option + Close	Closes file and ejects disk
Option + Quit	Exits from program, ejects both disks

Figure 1: These Option-key functions unleash hidden powers of the Font/DA Mover.

POWERING THE LASERWRITER

With great glee, we hooked up our new LaserWriter to an AppleTalk network. Within minutes, several people in the office printed out documents. When I tried to print my 30-page document with graphics, however, I kept getting the messages ERROR POSTSCRIPT and CANNOT PRINT THIS MACWRITE DOCUMENT, and I occasionally got an extra blank page after printing other documents. After several days with three people troubleshooting without success, I called the Apple Computer, Inc. regional technical support number for help, to no avail.

In total frustration, I went back to the LaserWriter manual, hoping to find something I'd missed. The extra blank page turned out to be a clue. When I read in the addendum that this effect could be caused by a voltage surge, we decided to try plugging the LaserWriter directly into an outlet, rather than into a power-strip extension.

Amazingly, this method allowed me to print my pages with graphics—but intermittently the problem occurred again.

Knowing that we had a power problem in this area, we immediately purchased a line conditioner/stablizer and plugged the LaserWriter and Macs directly into it. We are happy to report that since then we've had no further problems printing out documents on our LaserWriter!

Incidentally, I also attribute some previous catastrophic system crashes on my Mac to this cause and wish we had paid more serious attention to the notion that it was due to a continual power problem.

I hope this tip will save others some frustration.

Barbara J. Somers
Deerfield Beach, FL

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[1] - Substitute **Imagewriter II** for Imagewriter. Any set add $1.00.
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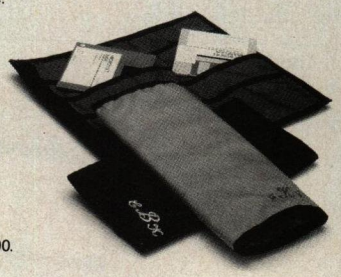

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Concept Publishing Systems offers two types of publishing systems—AdNet for the Macintosh and NewsSet for the Apple IIe—that can work with the same LaserWriter printer. Both systems can typeset hyphenated and justified text, display advertisements, and other graphics. The AdNet system comprises a specially configured Macintosh equipped with a 10-megabyte internal hard disk, graphics tablet, and pen linked to a LaserWriter. The system offers several special ad-setting features and three type fonts with six variations of each font. The company also offers customer training.

The NewsSet text-entry and -editing system uses Apple IIe computers, either in a networked or a stand-alone mode, to set text at 216 lines per minute. NewsSet networks can consist of up to 63 Apple IIe's linked to a hard-disk central database of up to 126 megabytes' capacity. NewsSet systems are available with 5, 10, or 20 terminals; high-speed wire-service news capture; 1, 2, or 3 AdNet display-advertising terminals; 5.5-, 45.1-, or 126-megabyte networks; a LaserWriter; and all software, hardware, training, and installation. *(List Price: Starter Set (includes NewsSet, AdNet, and a LaserWriter), $17,719; each subsequent terminal with necessary hardware, software, and ancillary cards, $2200 each)*

Requires: Apple IIe or Macintosh

Concept Publishing Systems
126 Monroe Street
Beaver Dam, WI 53916
(414) 887-3731

CIRCLE READER SERVICE NO. **500**

MAC

SMARTPANEL

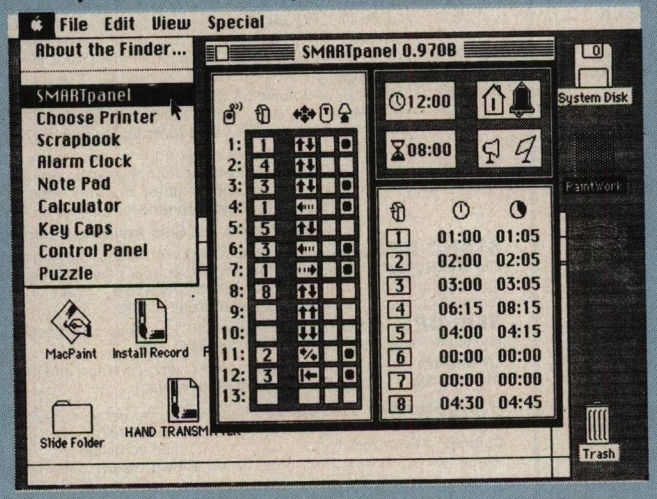
CyberLYNX Computer Products has introduced SMARTpanel, a software product that enables the Macintosh to work with any SMARTHOME control system. The software runs as a desk accessory on the Macintosh, so users can work on another application while SMARTpanel is running. SMARTHOME allows users to automate their home or small business, providing automatic appliance and lighting control, improved security, and energy savings. Users can control the system remotely with a hand-held controller if they so wish. *(List Price: SMARTHOME starter kit [hardware], $600; SMARTpanel, $100)*

Requires: Macintosh

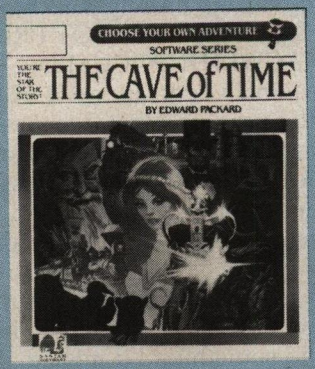
CyberLYNX Computer Products, Inc.
4828 Sterling Drive
Boulder, CO 80301
(303) 444-7733

CIRCLE READER SERVICE NO. **501**

SMARTpanel works with any SMARTHOME control system.



The Cave of Time, a new release in The Choose Your Own Adventure software series from Bantam

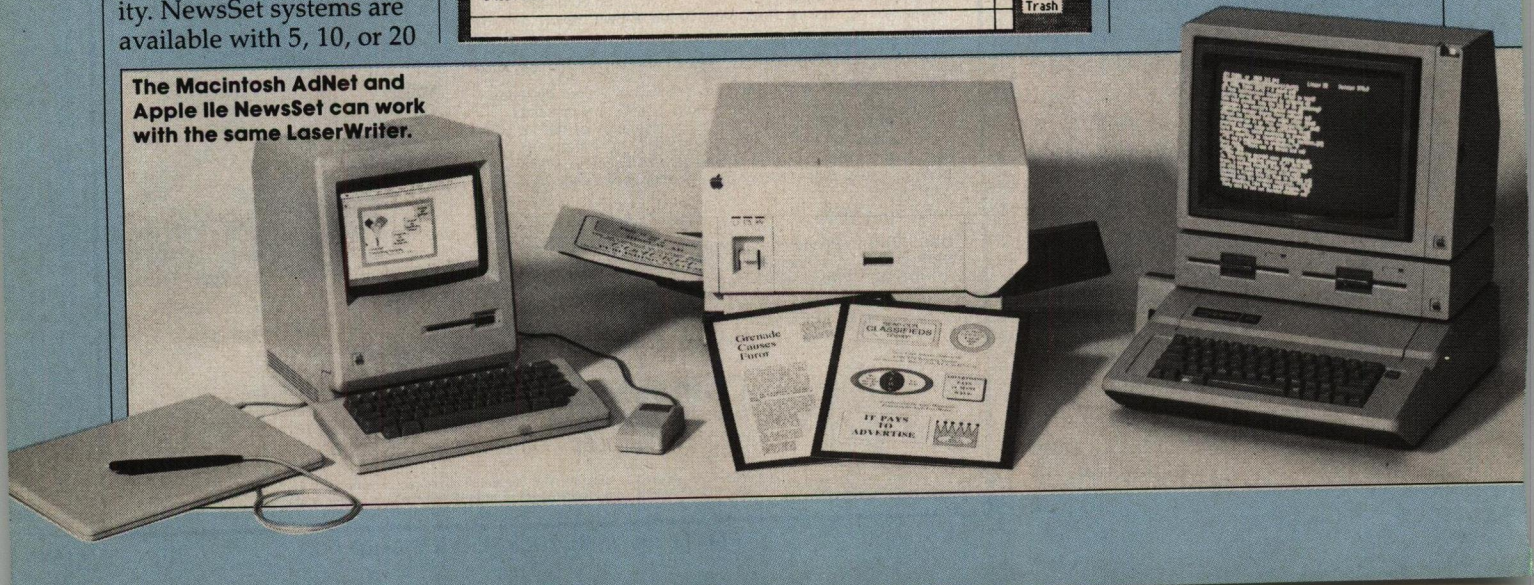


II SERIES

CHOOSE YOUR OWN ADVENTURE SOFTWARE

Bantam Electronic Publishing has released Escape and The Cave of Time, the first two adventure games in its Choose Your Own Adventure soft-

The Macintosh AdNet and Apple IIe NewsSet can work with the same LaserWriter.



ware series. Based on the books of the same name, the multiplot strategy games feature animated graphics and arcade-style action to challenge children aged 10 and up.

In Escape, following the original story by R.A. Montgomery, players lead three characters out of a mazelike city and across enemy territory to home. The game contains three sequences that can be played serially or individually and features a hands-on flying and driving simulator.

The Cave of Time, based on Edward Packard's story, is a travel adventure in which players must return misplaced objects to their owners in the fewest possible moves. Along the way, players have sword fights with ghouls, ride a prehistoric mammoth, and battle assassins. *(List Price:* $34.95)
Requires: Apple II-series computer

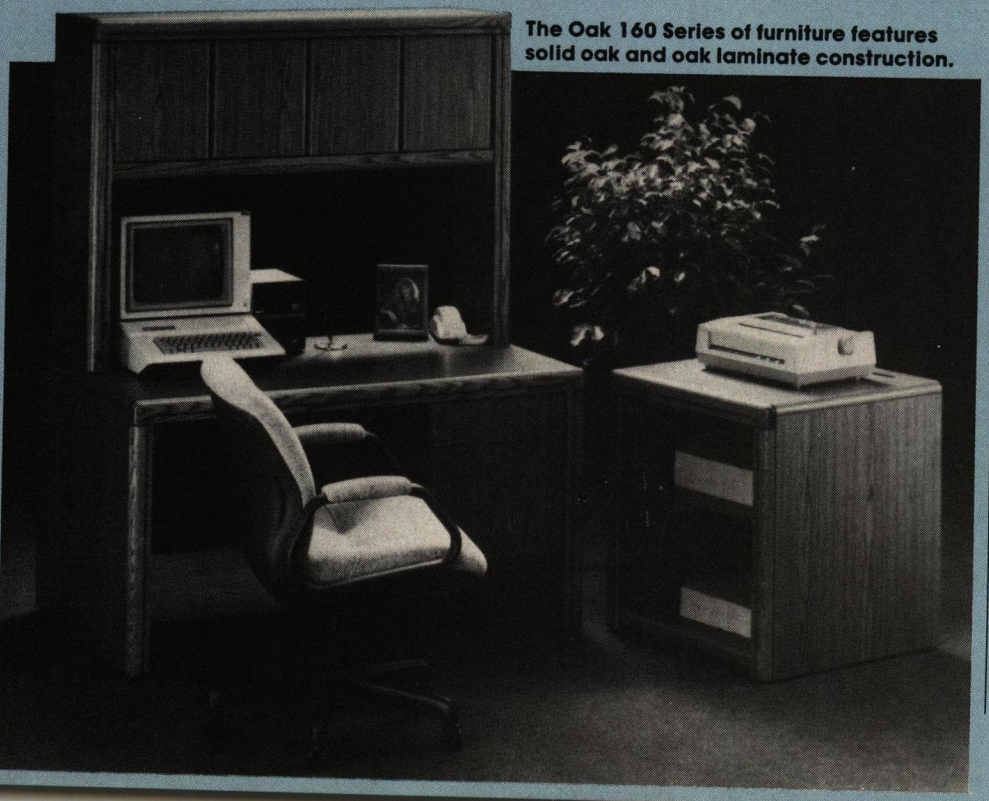
Bantam Electronic Publishing
Bantam Books, Inc.
666 Fifth Avenue
New York, NY 10103
(212) 765-6500
CIRCLE READER SERVICE NO. **502**

OAK 160 COMPUTER FURNITURE

Part of Bush's Artisan Collection, the Oak 160 Series is a new line of computer furniture constructed of solid oak and oak laminates. The ergonomically designed modular units feature softly shaped edges, a hand-rubbed lacquered finish, and fully finished backs.

The desk (model CT160) sets the keyboard at a 27-inch height and provides a 50 × 29-inch work surface. The pedestal module (CTA167) provides a three-quarter-extension box drawer and a full-extension file drawer and can be placed on either side of the desk. The box drawer is 4½ inches deep; the file drawer is 17⅛ inches deep and can hold letter- or legal-size Pendaflex folders. Both drawers have Accuride suspension.

The hutch (CTA161) has four doors behind which users can store software, binders, and accessories and provides ample headroom for a computer below. Finally, the printer stand (CT165) contains two top paper slots for both rear- and bottom-feed printers and has an adjustable center shelf. An optional caster kit (CTA10) is also available. *(List Price: desk, $199.95; pedestal, $140; hutch, $199.95; printer stand, $159.95)*
Bush Industries, Inc.
One Mason Drive
P.O. Box 460
Jamestown, NY
14702-0460
(800) 228-BUSH
in NY (800) 248-BUSH
CIRCLE READER SERVICE NO. **503**



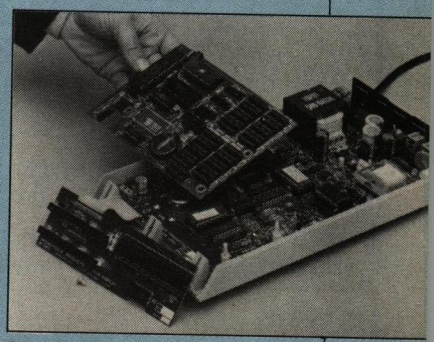
The Oak 160 Series of furniture features solid oak and oak laminate construction.

The Tac-10 joystick

II SERIES

TAC-10 JOYSTICK

Tac-10 is a combination Apple- and IBM-compatible analog joystick controller that has one handle-top and two case-mounted Do buttons that provide flexible cursor control from a variety of positions. Dual cursor-centering trimmers allow precise x- and y-axis cursor adjustment. Users can change between Apple and IBM systems by flipping a slide switch mounted on the underside of the joystick housing. *(List Price: $34.95)*
Requires: Apple II, II Plus, IIe, or IIc
Suncom, Inc.
260 Holbrook Drive
Wheeling, IL 60090
(312) 459-8000
CIRCLE READER SERVICE NO. **504**



ProModem 1200M communications buffer

MAC

PROMODEM 1200M COMMUNICATIONS BUFFER

Prometheus Products has designed an optional communications buffer that mounts inside the Macin-

Make Another Copy*
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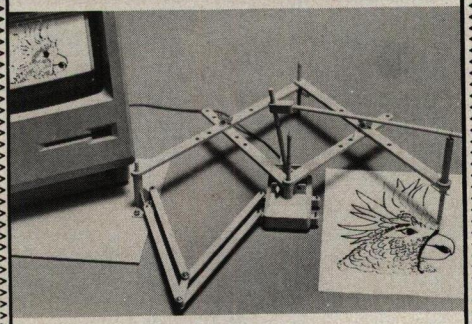

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OAK BROOK, IL 60522-1233

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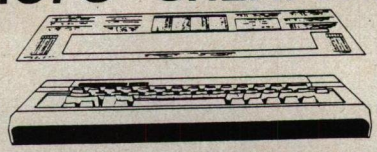

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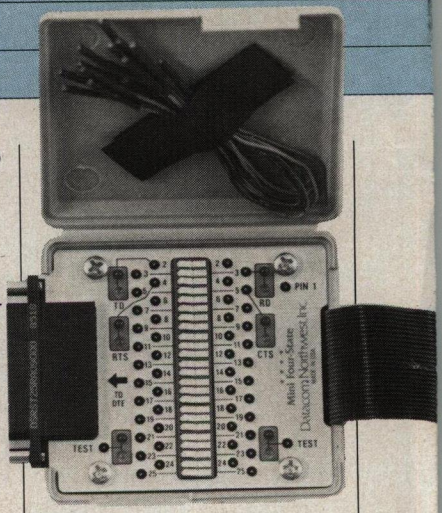

Incoming Data Alert detects and announces incoming signals on a computer data line.

tosh ProModem 1200M to receive electronic mail when the computer is unattended. The buffer comes with an open configuration to which users can add up to 512K of memory by adding RAM chips. The buffer has a built-in clock calendar that lets users send stored messages at a later time and a set of commands that instruct it to dial numbers at specified times and deliver messages to all answering modems. Its telephone directory and log-in commands are stored in 2K of battery-backed CMOS RAM as a protection against power failures. Other features of the buffer include serial-interface printer buffering and both password and call-back security levels. Also available is an optional 12-character LED alphanumeric display. *(List Price: Communications Buffer, $149; LED display, $99)*

Requires: Macintosh, ProModem 1200M

Prometheus Products, Inc.
4545 Cushing Parkway
Fremont, CA 94538
(415) 490-2370

CIRCLE READER SERVICE NO. **505**

HARDWARE

INCOMING DATA ALERT

Designed to monitor personal-computer, modem, and electronic-mail systems, the Incoming Data Alert (IDA) detects incoming signals on a computer data line. Upon detecting a signal, it sounds an audible beep and lights a red LED. The beep sounds for about 15 seconds, and the LED stays lit until reset. The device can be connected in series with any RS-232 line. It uses a 9V battery and comes with a dual DB-25 connector adapter. *(List Price: $49.95)*

Data Spec
A division of Alliance Research Corporation
20120 Plummer Street
P.O. Box 4029
Chatsworth, CA 91313
(818) 701-5848

CIRCLE READER SERVICE NO. **506**

MEGAMAC PLUS 20

The MegaMac Plus 20 Expansion System adds a 1-megabyte memory board and an internal 20-megabyte fixed disk to an existing Macintosh computer. The 3½-inch hard-disk unit features automatic drive-head parking when revolutions pass below 300 RPM. The system also provides external video capability for up to four external video devices through a BNC connector. The standard upgrade configuration enables the computer to work at speeds 12 times faster than normal; an optional Motorola 68881 arithmetic coprocessor chip can increase standard processing rates by 50 times. Accompanying software

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4Z296

allows for either a full megabyte of contiguous memory or 512K each of partitioned RAM and of contiguous memory. *(List Price: $2495)*

Requires: Macintosh

MicroGraphic Images Corporation
7334 Topanga Canyon Blvd.
Suite 115
Canoga Park, CA 91303
(818) 992-1190

CIRCLE READER SERVICE NO. **507**

MAC

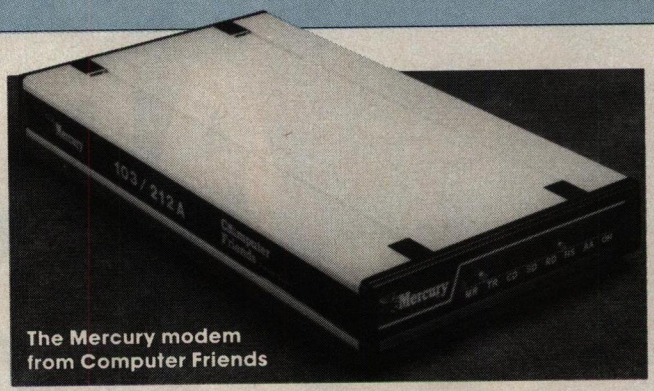
MAGIC SYSTEM

A complete MAGIC system containing both MAGIC, the MAcintosh Graphic Input Controller, and an RCA TC 1501 high-resolution video camera is now available. MAGIC enables Macintosh users to digitize high-quality graphics via a video camera or a VCR. The RCA 1501 camera provides a resolution of 550 dots by 500 lines; uses Auto Target Control to attain a light range of 10,000:1; and has tripod mounts on bottom and top. It comes with a BNC video connector and cable and a 16mm fl.6 C-mount lens. *(List Price: Complete system, $549; RCA TC 1501 camera, $225)*

Requires: Macintosh

New Image Technology, Inc.
10300 Greenbelt Road
Suite 104
Seabrook, MD 20706
(301) 464-3100

CIRCLE READER SERVICE NO. **508**



The Mercury modem from Computer Friends

MERCURY MODEM

The Mercury 300/1200-bps modem from Computer Friends complies with Bell Standards 103 and 212A and is fully compatible with Hayes' Smartmodem 1200. The modem's features include full- or half-duplex operation, auto-dial, auto-answer, and auto-speed-selection. Its front panel contains status display lights, and it comes with power supply, a manual suitable for first-time modem users, and a phone cable. *(List Price: $265)*

Computer Friends
6415 S.W. Canyon Court
Suite 10
Portland, OR 97221
(800) 547-3303
in OR (503) 297-2321

CIRCLE READER SERVICE NO. **509**

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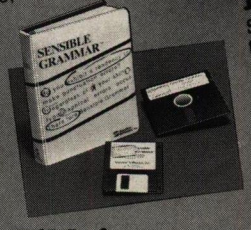

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†Note: CP/M, Pascal and PFS: WRITE-DOS versions do not suggest correct spelling of words or allow immediate correction of misspellings.

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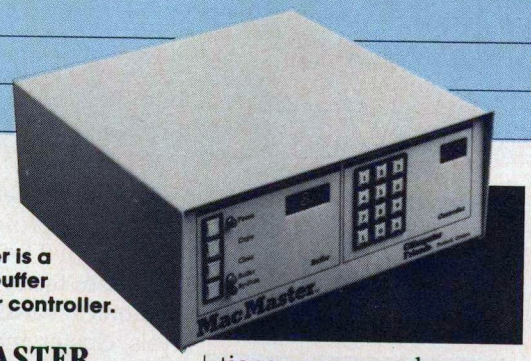

Mac Master is a universal buffer and printer controller.

MAC MASTER

When functioning as a buffer, the universal buffer and printer controller Mac Master frees the computer while its memory content is printed, stored in the buffer, or sent to a peripheral. The unit has multiple-copy functions and provides on-line numbering of the copy being printed. As a printer controller, Mac Master can store up to 99 control strings that users can call from the front-panel keyboard. By combining the buffer and controller functions, users can also change printing parameters using one command and without exiting from their application programs. The unit is available in serial and parallel versions and with three memory options—64K, 256K, and 1 megabyte. *(List Price: 64K, $299; 256K, $450; 1 megabyte, $750)*

Computer Friends
6415 S.W. Canyon Court
Suite 10
Portland, OR 97221
(800) 547-3303
in OR (503) 297-2321

CIRCLE READER SERVICE NO. **510**

HARD/SOFTWARE

MAC

ASSIMILATION MIDI PRODUCTS

Two new products for use with MIDI-equipped devices and Macintosh computers are available from Assimilation. The M • I • D • I Conductor, a musical-instrument digital interface, lets the Macintosh communicate with such devices as electronic musical instruments, lighting controllers, and mixing boards. The interface plugs into a Macintosh serial port and itself contains a 9-pin RS-422 serial port through which another device can share the computer's 9-pin jack. It has both an input and an output cable that connect to the MIDI-equipped device so that the Macintosh can simultaneously transmit and receive MIDI data.

For use with the interfaced Macintosh system is the M • I • D • I Composer, software that lets you record, play back, and re-record on up to 4 different tracks on one of 16 different MIDI channels on each track. Because the software records MIDI data, on playback you hear the performance exactly as you played it. You can record each of the four tracks separately and hear them one at a time or simultaneously. You can also name the recordings and save them to disk.

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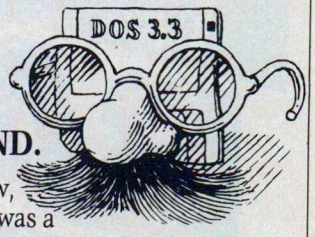

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meacom

P.O. Box 272591, Houston, TX 77277
(713) 526-5706 , Telex: 4945935

VISA and MC accepted. UniDOS is written by David Hemmo and Marc Moini. **For Macintosh Owners:** Meacom also offers Mac + II, an AppleIIe emulator (128k, 80 column) for your 512k Mac or MacPlus. UniDisk 3.5 and Macintosh are trademarks of Apple Computer, Inc. UniDOS is a trademark of Meacom.

CIRCLE 171 ON READER SERVICE CARD

(List Price: M•I•D•I Conductor, $89; M•I•D•I Composer, $29)
Requires: Macintosh
Assimilation, Inc.
20833 Stevens Creek Blvd.
Suite 101
Cupertino, CA 95014
(800) MAC-5464
in CA (800) 421-0243
CIRCLE READER SERVICE NO. **511**

II SERIES

VOICE MASTER

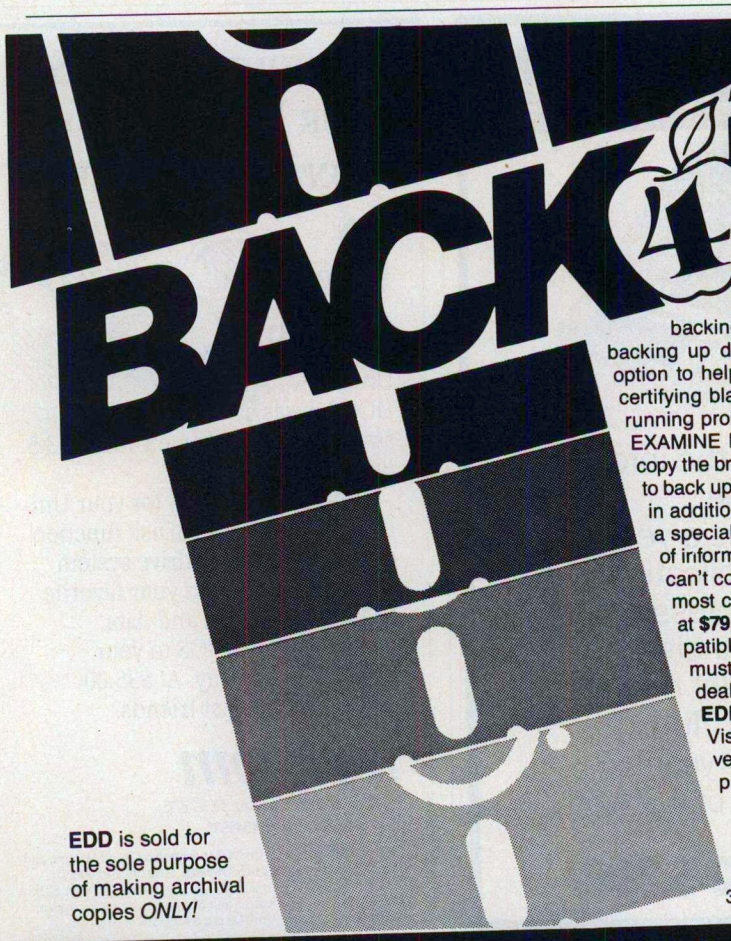
A hardware and software system that provides speech and music synthesis and voice-recognition abilities, Voice Master lets you record your voice digitally to produce vocabularies of up to 64 words or phrases. You can then instruct the unit to play back words or phrases, which it does in high-quality sound that closely resembles a tape recording of your voice. Because its speech functions are software-based and do not rely on phonemes, the unit can reproduce virtually any spoken language. Voice Master can also recognize voices and store vocabularies of up to 32 words or phrases on each floppy disk. In addition, an included voice-harp program lets you hum a melody into the headset microphone; store, play back, arrange, and edit it; and then print it out in musical notation on a dot-matrix printer. *(List Price: $89.95)*
Requires: Apple II Plus, IIe, or IIc
Covox, Inc.
675-D Conger Street
Eugene, OR 97402
(503) 342-1271
CIRCLE READER SERVICE NO. **512**

SOFTWARE

MAC

STAT80

Standard and professional versions of the statistical package STAT80 are now available for Macintosh computers. The standard version provides 27 statistical procedure commands, ranging from simple data description to multiple regression and analysis of variance. Eighty-eight additional commands provide extensive data-management and miscellaneous functions. The professional version of STAT80 also provides factor analysis, canonical correlation analysis, cluster analysis, and an extensive matrix facility. Suitable for novices, the package uses pull-down menus, has a command-by-example mode and on-line help, and gives users clear feedback for correcting mistakes. *(List Price: standard version, $249; professional version, $399)*
Requires: Macintosh 512K, external drive
Statware
P.O. Box 510881
Salt Lake City, UT 84151
(800) STAT80-S
in UT (801) 521-9309
CIRCLE READER SERVICE NO. **513**



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SO WHAT SOFTWARE

Two new packages—Disc Commander and Iconix—are now available from So What Software.

Disc Commander is a comprehensive disk- and DOS-editing system for Apple II computers using DOS 3.3 with or without the PRONTO-DOS enhancement. The system features four editors and 13 subeditors that are completely menu-driven. Editor 1 can create a disk map showing track/sector usage; can create track/sector lists; and can catalog tracks/sectors, the volume-table of contents, and any errant track/sector. It can also rewrite any catalog listing in normal, inverse, flashing, lowercase, or control characters; has Trace and Sort functions; and has a track/sector editor with an ASCII-decimal-hex display. Editor 2 enables users to edit DOS commands; Editor 3 lets them edit DOS error messages; and Editor 4 enables users to control catalog formats.

Iconix is a graphics and animation editor that enables users to edit hi-res images directly from the keyboard and to capture and compile icons from a section of any hi-res screen. Users can overlay icons on images or save them to disk and manipulate them from other programs to create animations. Users can also manipulate icons using the package's Draw, XDraw, or Float commands, and the package includes additional machine-code modules that let users wipe and swap images between screens or memory ranges and scroll all or part of hi-res screens.

Finally, Iconix includes Scredit, an editor for text and for preparing low-res graphics screens. *(List Price: $29.95 each)*

Requires: Apple II, II Plus, IIe, or IIc; Disc Commander—48K; Iconix—64K

So What Software
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Fountain Valley, CA
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Mindscape, the publisher of Racter, has founded a users' group—The Institute of Artificial Insanity—for the program's users. Racter is an offbeat program that uses a 2800-word built-in vocabulary and grammatical expertise to converse with users. All program packages contain an application form for the institute, which users can complete and send in along with "before Racter" and "after Racter" photographs that show how their experience with Racter has changed them. The institute offers an optional yearbook containing information about other Racter users. *(List Price: Racter, $44.95; yearbook, $15)*

Requires: Apple II, II Plus, IIe, or IIc; 128K RAM—or Macintosh 512K

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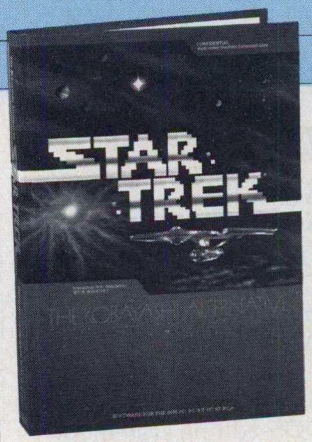

Star Trek: The Kobayashi Alternative is a new text-adventure game from Simon & Schuster Computer Software.

MAC

MACFONT 1

When used in conjunction with the Font Mover application program, MacFont 1 provides Macintosh users with a substantially larger font selection. MacFont's fonts are menu-selectable and reside in system files in the same way as do fonts included with Apple's MacPaint and MacWrite programs. The disk contains all instructions necessary for loading the fonts into the computer's system files. *(List Price: $29.95)*

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Requires: Apple II, II Plus, or IIe; 48K RAM; AppleWorks 1.2
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(206) 672-6909

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Star Trek: The Kobayashi Alternative is an interactive text-adventure game in which players assume the role of Captain Kirk, commander of the starship Enterprise, in a mission to recover a missing Federation ship commanded by Lieutenant Sulu. Players have all the Enterprise's resources—phasers, transporters, communications, sensors, and crew—at their disposal. Their success depends on their ability to balance force with diplomacy and words with actions and to communicate with beings from other worlds. The program uses windows to present multiple channels of information simultaneously and has a personality database that ensures that each Star Trek character acts and speaks in character. *(List Price: $39.95)*

Requires: Apple II, II Plus, IIe, or IIc; 64K RAM
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1230 Avenue of the Americas
New York, NY 10020
(212) 245-6400

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LogicWare's CADCD: Software for Computer Aided Digital Circuit Design performs minimization of Boolean functions into minimum sum-of-products and/or product-of-sums form. The menu-driven program can handle up to eight input variables, and up to eight output functions, as well as "don't care" conditions. For easy design of sequential machines, the program can use up to eight J, K, or D flip-flops. Users enter Boolean functions in truth-table format and can then edit, save on disk, load from disk, or print the tables. For sequential-machine design, the truth table expresses the next state of each flip flop as a function of the current state and other inputs. *(List Price: $59)*

Requires: Apple IIe or IIc

Logicware
2346 West Estrella Drive
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An illustrated-book writer for 8- to 14-year-olds, KID PRO QUO: The Illustrated Word Processor lets users write text, draw, paint, animate pictures, and compose music. The program comes with a built-in music fanfare library and a library of predrawn figures that children can incorporate into their own creations. Children can print out their on-screen creations for many different purposes. The program comes with a step-by-step on-screen tutorial and an easy-to-read manual. *(List Price: $39.95)*

Requires: Apple IIe or IIc, 64K RAM, one disk drive

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Requires: Apple IIe or IIc

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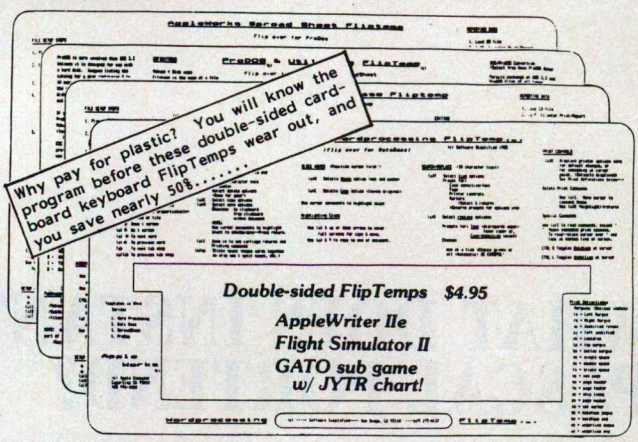

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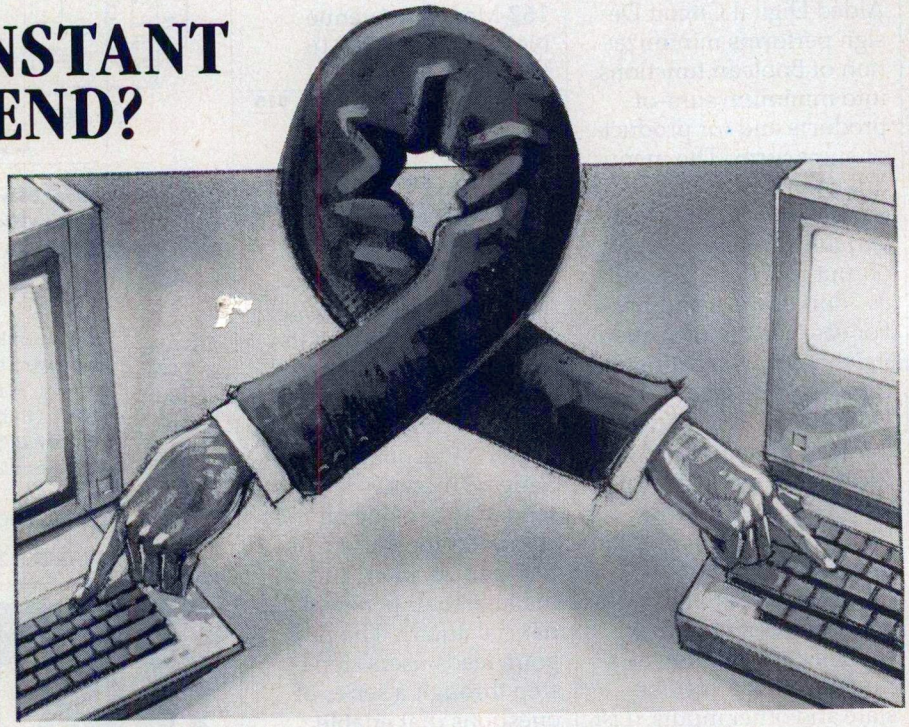
BY STEVE ROSENTHAL

WHAT DOES INSTANT PASCAL PORTEND?

Signs of Apple's future: hardware dichotomy, software compatibility



The academicians who chose Pascal as the preferred language for computer instruction during the mid-80s had all the arguments on their side—except practicality. Pascal, for all of its elegance and logic, invariably appeared in the real world as a compiler (meaning that a Pascal program had to be completely written and edited before it could be translated to the form the machine could execute).

Compilers are powerful tools for production programming, and every serious language needs one for business use and software development. Unfortunately, they're not very conducive to learning. The initial knowledge barrier you have to surmount to produce a program successfully, the difficulty of finding errors, and the time it takes to make revisions are all too high.

Fortunately, Apple has a better Pascal pedagogical solution. With the new release of Instant Pascal for the Apple II series of computers joining Macintosh Pascal for the Apple 32-bit line, Apple now has a pair of Pascal implementations that should satisfy both the theoretical and practical needs of computer instruction.

Perhaps just as importantly for Apple II owners, Instant Pascal represents a significant continued commitment by Apple to serious education on its senior machine; it shows that machines don't have to be identical to be compatible; and it's one more instance of Apple's success in applying lessons learned on the Mac to the product line that built the company.

WILLIAM CONE

Interpreting Pascal

If you've seen Macintosh Pascal, you should need little convincing about the virtues of Instant Pascal (see *A+*, November 1984, for Dennis Brothers' glowing review of Macintosh Pascal). As Apple and developer Think Technologies promised, Instant Pascal is a faithful reproduction of the earlier Macintosh product.

Actually writing and running programs is universally considered a key element in effective computer instruction.

Both Instant Pascal and Macintosh Pascal are interpreters (programs that translate each line of source code into machine form and execute it before moving on to the next line), much like Applesoft or Macintosh BASIC. They won't ever let you create fast, efficient commercial applications, but they will let you pick up Pascal and programming in general with many fewer distractions.

Both versions utilize multiple windows, a mouse, and pull-down menus. On both, you can set break points (stopping points within the program), pull up an observation window to watch the value of a variable, and step through the program manually or automatically.

You can also pull up an Instant window and run a Pascal statement or two immediately, a feature that Pascal ordinarily lacks because every Pascal statement must normally be framed in a complete program structure before it can be processed.

Educational Value

In classroom use, all these features make it easier to start off students with simple programs and then expand to more complex concepts. That ability is important, because actually writing and running programs is uni-

versally considered a key element in effective computer instruction. In compiled Pascal versions, students have to learn a lot of linguistic detail before they can run anything, but with the Instant Window feature, you can start off with a single Pascal line.

Learning from mistakes is also a vital element, and the Instant Pascal/Macintosh Pascal pair helps out here too. With the observation window to let you see the value of your variables and a program window separate from the text and graphics output, you can follow along as your program executes in a step-by-step mode to see if it makes any unwanted turns.

Moreover, because the versions on the two machines are so similar, you can bring programs written on one machine over in source-code form to run on the other. You can start a program in class on one machine and then continue working on it at home on the other, or a single class can use both Macs and Apple IIs without the teacher constantly having to point out differences between the two types of hardware.

You'll notice a few minor differences between the two versions. Instant Pascal doesn't offer multiple typefaces, but it has color. The Mac version has a Search and Replace function, but on the Apple II you have to repetitively paste from the Clipboard to replace items. The Mac version runs noticeably faster.

Other Lessons to Learn

Better Pascal programming isn't the only lesson we can learn from Instant Pascal. On the marketing side, the evolution from Macintosh Pascal to Instant Pascal tells us a lot about how Apple currently sees its place in the world.

Instant Pascal is unabashedly aimed at the classroom market, rather than at software authors or hobbyists. When you open the package, you won't find an ordinary tutorial and reference manual, but instead a textbook entitled *Apple II Instant Pascal, An Introduction to Programming*, published by Houghton Mifflin Company. It is, according to the preface, "appropriate for a one-term introductory programming course."

Instant Pascal's release can also teach us a lesson about hardware and software coevolution.

If you want a reference guide to Instant Pascal, you will have to buy it separately. It is also published by Houghton Mifflin and is available from Apple dealers as well as bookstores. Although Apple has been generally moving toward supplying only user information with products and offering the reference manual as an option, it's certainly a strange practice with a language.

I read Apple's approach to the documentation as a tacit admission that we won't be seeing the companion Pascal compiler that was originally promised to go with these interpreters, at least not on the Apple II. Instant Pascal is a strictly educational product, and Apple won't be promoting it for general programming or business use.

That's also the message I get from Apple's choice of having the manual published by a major texbook house instead of under its own imprimatur. Apple might not have a salesperson ready to call on every school district, but Houghton Mifflin probably does. Strategic alliances have become a key part of Apple's marketing strategy.

Education has always been a key market for Apple, and elementary schools in particular have become the Apple II line's special bastion. With the College Board computer exam in Pascal, however, and high schools increasingly tempted to go for more "serious" machines, Apple has taken a key step to reinforce the attractiveness of the machine for use in the higher grades.

Coevolution

Instant Pascal's release can also teach us a lesson about hardware and software coevolution. It's now quite clear that Apple cannot afford to (and doesn't want to) give up either the Apple II or the Macintosh, yet marketing and supporting two such different machines is difficult.

One alternative is actually to merge the hardware. Apple has taken a few steps in that direction (adopting the UniDisk for the Apple II line, making the ImageWriter compatible with both machines, and so on), but so many existing programs make use of unique hardware features that a complete reconciliation doesn't seem possible.

Another alternative is to equip each machine with a coprocessor that

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lets it emulate the other (see "More Power to the Process: Coprocessors" in the December 1985 issue of *A+*, pages 55–62, for a detailed discussion of coprocessors). Unfortunately, until the Mac has color and the II line a higher-resolution screen, it probably won't be sufficient just to add another central processor.

The last alternative is to maintain the hardware dichotomy but merge the software at the user level, which is the strategy Apple has adopted in this case. With interchangeable software and peripherals, Apple can assure users that most of their investment is protected if they stay with Apple.

In the case of Instant Pascal, Apple can tell a school that it can mix Apple IIs and Macs (but not IIs and Blues, so to speak), and Apple will support the combination. Apple IIs can still be used for all those wonderful color games and educational programs, but they can also be a tool for serious computer instruction.

Compatibility for the Rest of Us

The porting of Macintosh Pascal into Instant Pascal is, of course, not an isolated act. Apple has been working to bring many of the successes of the Macintosh to the Apple II line, from the mouse-and-windows interface to languages and application programs.

If enough independent software vendors also took this approach, Apple would be able to present its technologically divergent product line as a related set of choices. Perhaps not coincidentally, that's what IBM did when it brought out its 360 line of mainframes in the mid-60s—not only was it the most successful product line the firm had ever sold, but it also vastly increased the software offerings for every machine in the line (although in that case the machines were compatible even at the assembly-language level).

Altered Focus

This year, by both rumor and Apple's own predictions, should be a year of product introductions for Apple. Because Apple is maturing, we'll see attention paid to compatibility as well as diversity. As the industry grows up, functionality rather than circuitry is the valued product. ✚

Steve Rosenthal learned his lessons teaching Pascal and now writes regularly for A+ and other magazines instead.

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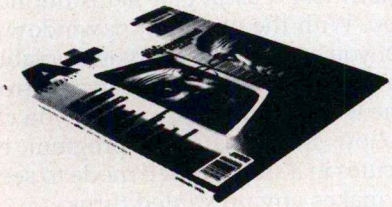

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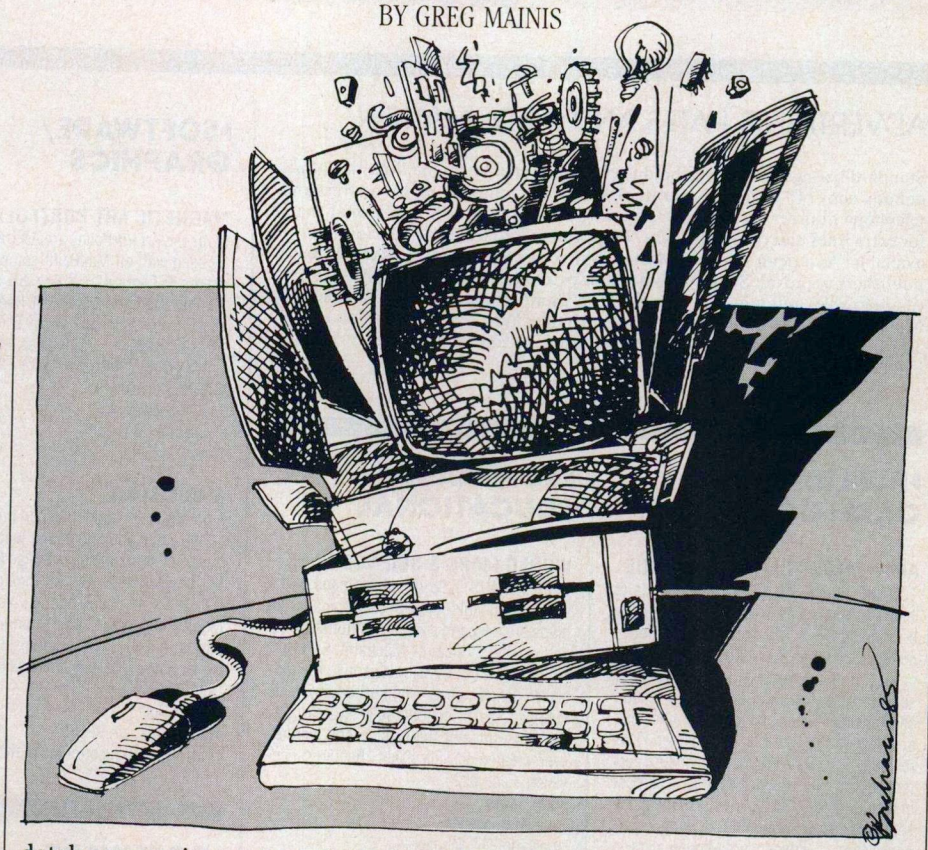

DATABASE/SPREADSHEET TRANSFER WITH DIF FILES

Q. *I use an enhanced Apple IIe and AppleWorks. I need to transfer information from the database to the spreadsheet and vice versa. The manual tells me to use DIF files, but I do not understand how to do this. When I tried to create a database file from a DIF file, the program wrote to my program disk and the file was unusable.*

A. You are describing two problems here. The first is the DIF conversion, and the second is directing where the data is to be placed. The DIF conversion from either database or spreadsheet is not as difficult as you may think. Below I have outlined the step-by-step process of converting the database to the spreadsheet and vice versa. If you require further information on data transfer, check "Business AppleWorks, Part II" by Charles Rubin, *A+*, July 1985, and "Moving Data with AppleWorks" by Charles Rubin, *A+*, November 1985.

1. To convert your database, you will have to create either a labels or tables report by using the open-apple-P command.
2. Print the report to the disk by typing open-apple-P and selecting the DIF option.
3. You will be prompted for a pathname. Place a formatted ProDOS disk into the disk drive and save this new file.
4. From the Add Files menu, make a new spreadsheet file. Select the DIF file option (number 2), and again you will be prompted for the pathname of your database DIF file.
5. Place the disk with the DIF file into the disk drive and type the pathname.
6. Name your new spreadsheet file.
7. Each field will occupy one cell of the spreadsheet. Each record will be converted into one row of the spreadsheet.

Converting a spreadsheet into a database requires many of the same steps, but you need to determine how the data format is to be saved:

1. Print your spreadsheet, using the open-apple-P command. You have the option of printing all or part of the spreadsheet.
2. Print the spreadsheet to the disk with the DIF option.
3. You must choose either a row or a column format for printing the DIF file to the disk. If you choose rows, the first record in the database will consist of the information for row A1 through AD1 and the second A2 through AD2. If you choose columns, the first record will include information from column A1 through A30, and the second will include information from B1 through B30. Remember the database can hold only 30 fields per record.
4. Place a formatted ProDOS disk into the disk drive and type the pathname.
5. Add a new database file by selecting the DIF option.
6. Place the disk with the DIF file into the disk drive and type the pathname.
7. Name your new database file. You can change the category name by pressing open-apple-N and replacing the old names with the new ones.

APPLEWORKS QUERIES

Q. *How do I tell which version of AppleWorks I have, and what are the differences? Is there a good book that will help me get the most out of AppleWorks and my enhanced IIe?*

A. Each time you run the AppleWorks start-up disk, a copyright notice, such as Copyright Apple Computer 1983, appears in the lower quadrant of the screen. The version number (such as V1.2 USA, which shows you that the version is 1.2) is directly to the right of this notice.

The major difference between AppleWorks Version 1.1 and 1.2 is the printer-interface section. The later version gives you more flexibility in adapting different interface cards and configuring more printers.

Several good books are available that describe the nuances of AppleWorks. Take a look at *AppleWorks* by Charles Rubin, published by Microsoft Press. +

Please send your questions and problems to Rescue Squad, A+, 11 Davis Drive, Belmont, CA 94002.

YVONNE BUCHANAN

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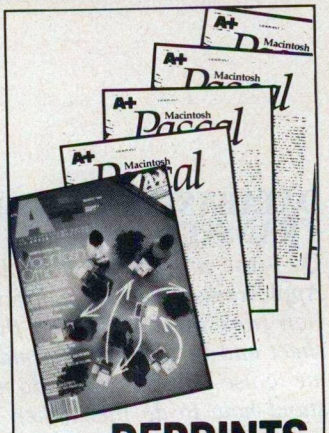

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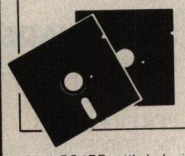

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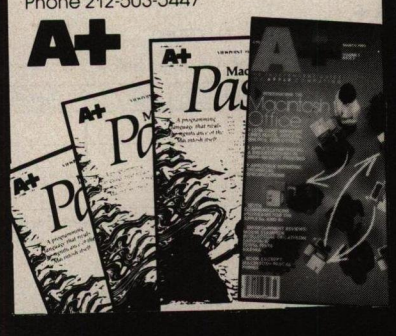

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AD INDEX BY PRODUCT CATEGORY

ACCESSORIES

PAGE

CARRYING CASES
Cabbage Cases 84

DISKS
Echo Data 126
Precision Data Products 152

MISCELLANEOUS
Cheatsheet 146
Computer Cover Company 143
Norwich Data Services 166
Puma 105

BOOKS

PAGE

Haba Arrays 151
Q-Mar 75

HARDWARE

PAGE

DISK DRIVES/STORAGE DEVICES
First Class Peripherals ... 54, 55
General Computer 118

INTERFACE CARDS
Applied Engineering 10, 14, 17, 19, 21, 23, 31, 41, 57, 135
AST Research 2, 3
Checkmate Technology . 26, 27
Hanzon 36
Information Appliance 81
Legend 33
Levco 127
Ohio-Kache 113
Orange Micro 82
Software Simplified 153
Titan Technologies 95

MISCELLANEOUS
Cauzin 68,69
Cirtech 96
Computer Friends 76
Covox 106
Diversions 152
Innovative Products 146
Kensington Microware 39
Quorum International 42
Roger Coats 89

MODEMS
Cermetek 50
Hayes Microcomputer Products 32

PRINTERS/PRINTER ACCESSORIES
Texprint 74

MAIL ORDER

PAGE

BCE 34
Business Computers of Peterborough 107
Byte General 52
Computer Discount of America (CDA) 112
Coit Valley 91
Computer Network 40
Conroy-La Pointe 73
Jameco Electronics 114
JDR Microdevices 136
Kyan 111
Northeastern .. 58, 59, 140, 141
PC Network 128, 129
Precision Data Products 152
Programs Plus 44, 45
Silicon Express 104
Software Dimensions 125
Zimco 155

SOFTWARE

PAGE

BUSINESS
Advanced Logic Systems 38, 90
BPI 5, 99
H & E Computronics .. Cover 2
PBI ..... Cover 4
Pinpoint Publishing 8
Public Domain 88
Russ Systems 30
Wiley Professional Software 109

COMMUNICATIONS
Meacom 138, 149

DATA MANAGEMENT
Consistent Software 75
PM Software 51
Rolodex 20
Statsoft 126

EDUCATION
Davidson and Associates 53
Springboard Software 1
Tom Snyder and Associates . 80

ENTERTAINMENT/ STRATEGY
Electronic Arts 92, 93
Epyx 22
Firebird 102
Professor Jones 151
Spectrum Holobyte 123
Strategic Simulations 60
Sublogic Corporation 4

FINANCIAL
Dow Jones Software 94

GRAPHICS
Diehl Graphsoft 122
Spectral Graphics Software 64, 166

MISCELLANEOUS
Chevron Chemical Corporation 37
Compucrafts 80
Megahaus 18
Musicworks 122
Pirates Harbor 77

ON-LINE SERVICES
Compuserve 12, 13
General Electric Information Services Company 62
Source 35
Viewdata 67

PERSONAL BUSINESS-HOME
Howard Soft ..... Cover 3

UTILITIES
Applied Informatics 108
Beagle Brothers 83, 110
Central Point Software 36
Pro-Pac 108
Utilico Microwave 150

WORD PROCESSING/SPELLING CHECKERS
Sensible Software 84, 148
SSI Software 49

ALPHABETICAL AD INDEX

READER SERVICE NO. — PAGE

A

117 Advanced Logic Systems, Inc. 38
104 Advanced Logic Systems, Inc. 90
* Applied Engineering 10
* Applied Engineering 14
* Applied Engineering 17
* Applied Engineering 19
* Applied Engineering 21
* Applied Engineering 23
* Applied Engineering 31
* Applied Engineering 41
* Applied Engineering 57
* Applied Engineering .. 135
255 Applied Informatics, Inc. 108
103 Asher Engineering Corp. (Memory Systems, Inc.) 116
323 AST Research, Inc. 2,3

B

322 BCE 34
126 BPI Systems 5
321 BPI Systems 99
147 Beagle Brothers 83
148 Beagle Brothers 110
* Business Computers of Peterborough 107
306 Byte General, The 52

C

292 CDA Computer Sales. 112
213 Cabbage Cases 84
120 Cauzin Systems, Inc. 68,69
318 Central Point Software .36
320 Cermetek 50
* Cheatsheet Products .. 146
128 Checkmate Technology, Inc. 26,27
159 Chevron Chemical Corporation 37
230 Cirtech 96
340 Coit Valley Computers .91
* Compucrafts 80
271 Compuserve 12,13
136 Computer Cover Co. . 143
195 Computer Friends 76
137 Computer Network 40
129 Conroy-LaPointe, Inc. .73
130 Consistent Software, Inc. 75
* Covox, Inc. 106

D

337 Davidson & Associates. 53
331 Diehl Graphsoft, Inc.. 122
* Diversions, Inc. 152
234 Dow Jones Software 94

E

123 Echo Data Services, Inc. 126
168 Electronic Arts 92,93
285 EPYX, Inc. 22

F

214 Firebird Software 102
154 First Class Peripherals 54,55

G

160 General Computer 118
319 General Electric Information Services Company 62

H

* H&E Computronics, Inc. ..... Cover 2
113 Haba Arrays 151
216 Hanzon Data, Inc. 36
296 Hayes Microcomputer Products, Inc. 32
* HowardSoft ..... Cover 3

I

165 Information Appliance .81
140 Innovative Products... 146
191 International Solutions .29

J

167 JDR Microdevices 136
279 Jameco Electronics ... 114

K

134 Kensington Microware .39
161 Kyan Software 111

L

287 Legend Industries, Ltd. 33
212 Levco 127

M

170 Meacom International 138
171 Meacom International 149
260 Megahaus Corporation .18
121 Musicworks 122

N

304 Northeastern Software 58,59
330 Northeastern Software 140,141
339 Norwich Data Services 166

O

178 Ohio Kache Systems Co. 113
253 Orange Micro, Inc. 82

P

241 PBI Software ..... Cover 4
315 PC Network 128,129
150 PM Software 51
192 Pinpoint Publishing 8
275 Pirates Harbor 77
228 Precision Data Products 152
132 Professor Jones 151
299 Programs Plus 44,45
174 Pro/Pac 108
256 Public Domain Exchange, The 88
112 PUMA 105

Q

281 Q-Mar Group 75
223 Quorum International Unlimited 42

R

108 Roger Coats 89
182 Rolodex Corporation ... 20
344 Russ Systems 30

S

222 SSI Software 49
105 Sensible Software 84
227 Sensible Software 148
231 Silicon Express 104
* Software Dimensions. 125
265 Software Simplified .. 153
* Source, The 35
109 Spectral Graphics Software 64
107 Spectral Graphics Software 166
142 Spectrum Holobyte ... 123
261 Springboard Software ... 1
207 Statsoft 126
131 Strategic Simulations ... 60
110 Sublogic Corporation 4

T

343 Texprint, Inc. 74
180 Titan Technologies, Inc. 95
187 Tom Snyder & Associates 80

U

190 Utilico Software 150

V

317 Viewdata Corporation, The 67

W

114 Wiley Professional Software 109

Z

155 Zimco 155

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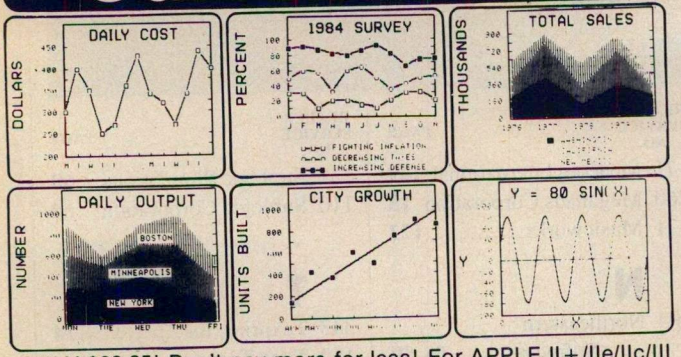

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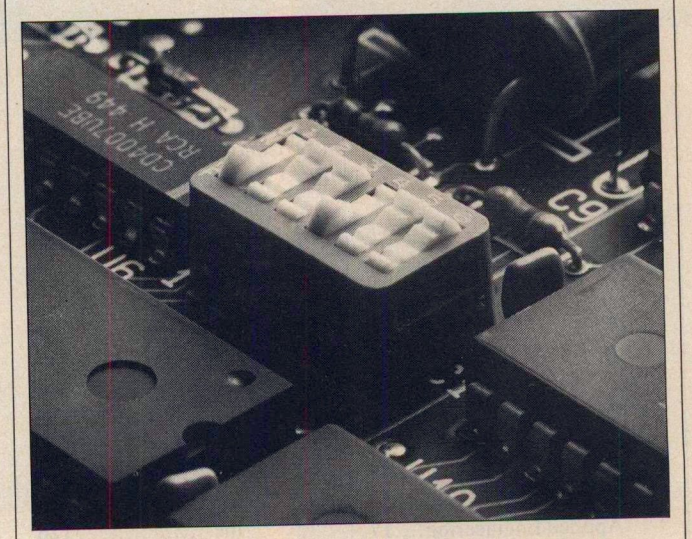

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Apple II	A	H
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Apple *II*e	C	J
Apple IIc	D	K
Macintosh	E	L
Other (specify)	F	M
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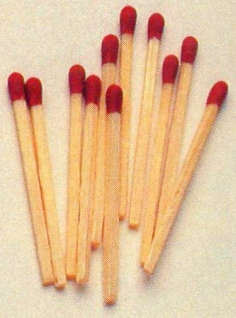

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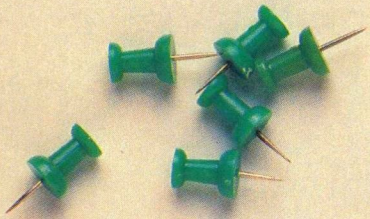

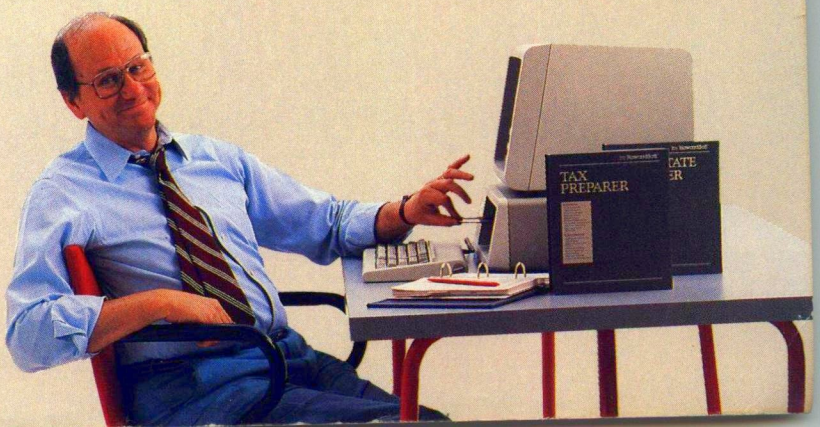

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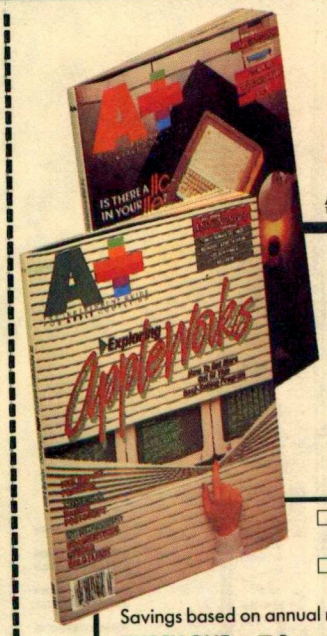

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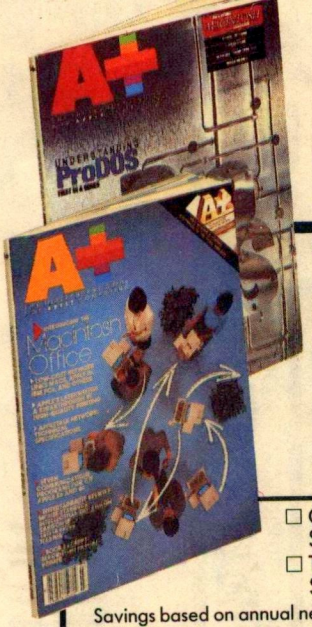

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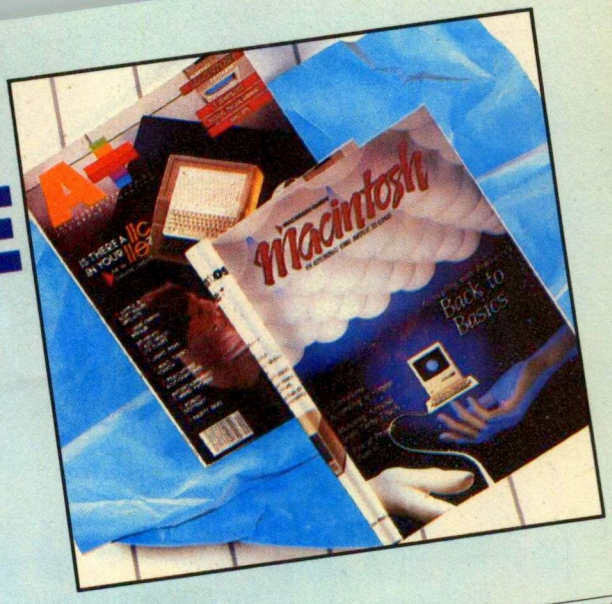

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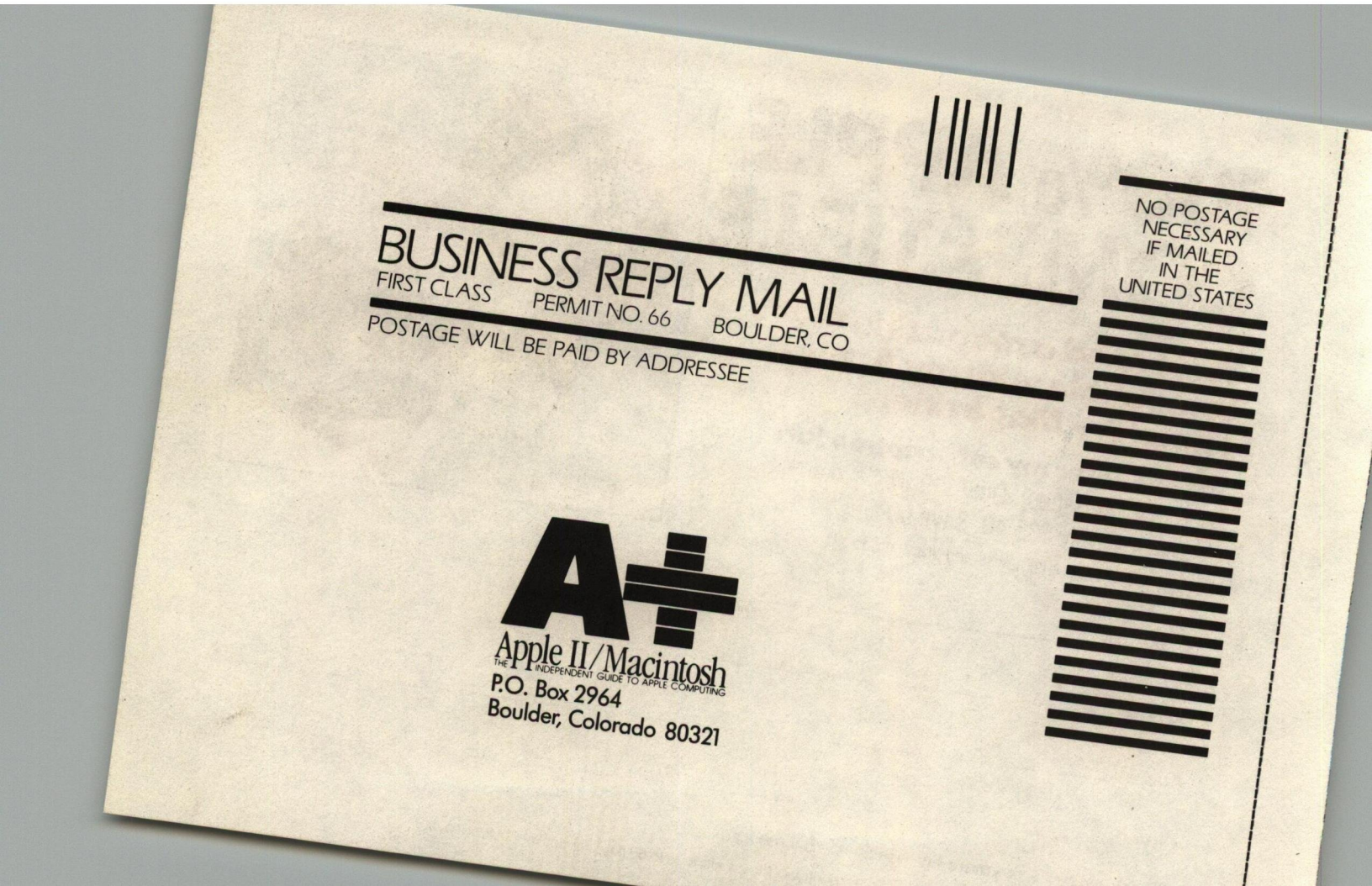
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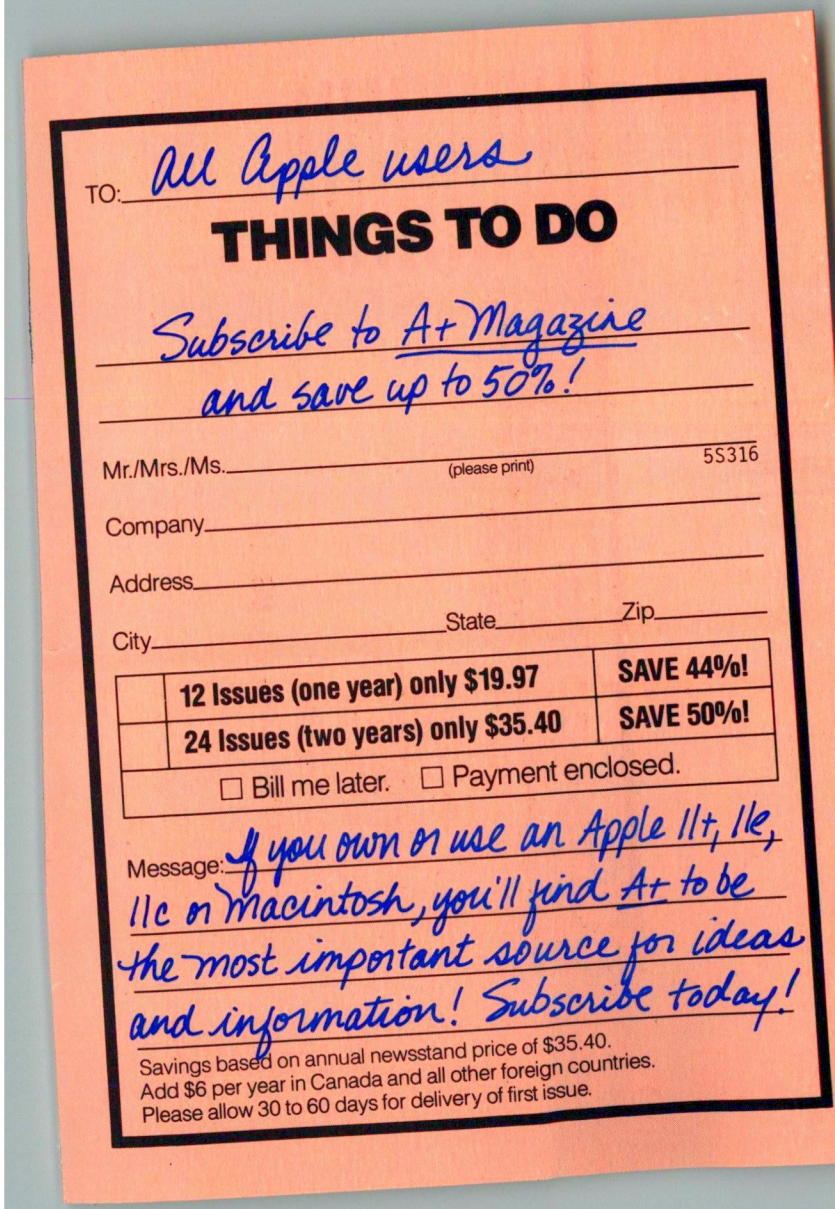

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